VOL. LXXX PART FIVE

JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

MAY 1955

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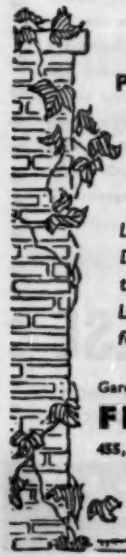

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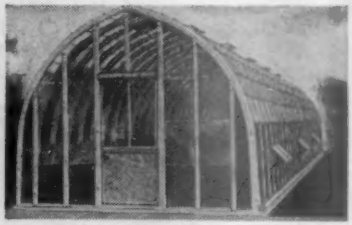

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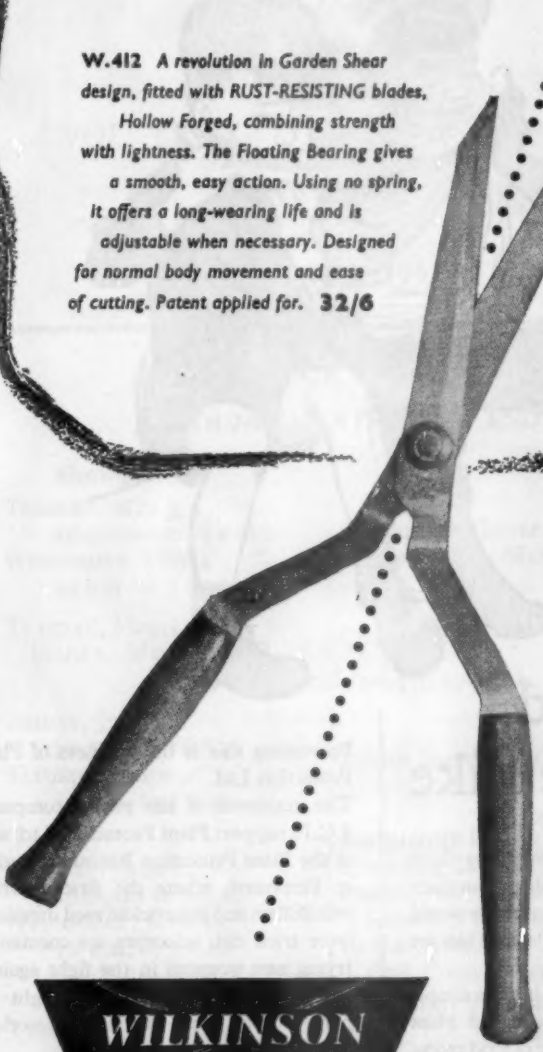

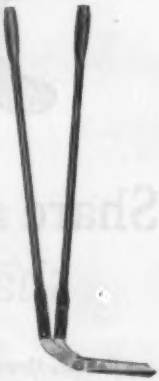

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JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

VOL. LXXX PART FIVE

May 1955

THE SECRETARY'S PAGE

ANNOUNCEMENTS—MAY AND JUNE

Shows

TUESDAY, May 3 12.30 P.M. to 6 P.M. WEDNESDAY, May 4 10 A.M. to 5 P.M.	Fortnightly Flower Show. Rhododendron Show.
TUESDAY, May 24 to FRIDAY, May 27	Chelsea Show.

For details see pp. 198–201.

FRIDAY, June 3 12 NOON to 6 P.M. SATURDAY, June 4 10 A.M. to 5 P.M.	British Iris Society's Show.
TUESDAY, June 14 12 NOON to 6 P.M. WEDNESDAY, June 15 10 A.M. to 5 P.M.	Fortnightly Flower Show. Flowering Tree and Shrub Competition. Cactus and Succulent Competition for Amateurs (Sherman Hoyt Trophy). British National Carnation Society's Pink Competition.
TUESDAY, June 28 12 NOON to 6 P.M. WEDNESDAY, June 29 10 A.M. to 5 P.M.	Fortnightly Flower Show. British Delphinium Society's Show. Cactus and Succulent Society's Competition. Geranium Society's Competition.

Lectures

TUESDAY, May 3, at 3 P.M. Masters' Memorial Lecture, "Light and Plant Growth," Part II, by PROF. R. H. STOUGHTON, D.SC., V.M.H.

TUESDAY, June 14, at 3 P.M. "Plant Collecting in the Australian Desert," by MR. F. HILL, B.SC., A.M.I.E.E.

TUESDAY, June 28, at 3 P.M. "Moisture-Loving and Bog Plants," by MRS. FRANCES PERRY.

Demonstrations at Wisley—The following demonstrations will be given at Wisley, that on the second day being in each case a repetition of that given on the first.

Flower Garden

May 18–19. The Summer Pruning of Shrubs. (Commencing at 2 P.M.)

Fruit Garden

June 29–30. The Summer Pruning of Fruit Trees. (Commencing at 2 P.M.)

The National Sweet Pea Society—The Society's 1955 Show will be held in Connaught Park, Dover, on June 29 (12 noon–9 P.M.) and June 30 (10 A.M.–8 P.M.) (*not in the R.H.S. Hall on July 5 as mentioned in the R.H.S. Diary*). The admission charge will be 2*s.* 6*d.* (children 1*s.* 3*d.*).

ARRANGEMENTS FOR CHELSEA SHOW, 1955

Private View – There will be a Private View on Tuesday, May 24, between 2 P.M. and 8 P.M., open only to Fellows and Associates on surrender of the special detachable parts of their annual tickets. The ticket issued to an Overseas Fellow when on a visit to the United Kindom will admit him or her to the Private View. For details please refer to the paragraph relating to Fellows' and Associates' tickets.

In no circumstances, by payment or otherwise, can extra admissions to the Private View be allowed.

Dates of Show – The Show will be held on Wednesday, Thursday and Friday, May 25, 26 and 27, in the grounds of the Royal Hospital, Chelsea, London, S.W. 3.

Times – Fellows and Associates

Fellows, Associates, and those presenting Fellows' Transferable Tickets are admitted free of charge during the following periods:

Wednesday, May 25	8.30 A.M. to 8 P.M.
Thursday, May 26	8.30 A.M. to 8 P.M.
Friday, May 27	8.30 A.M. to 5 P.M.

The Public

Admission on payment may be obtained only during the following periods :

Wednesday, May 25	12 NOON to 8 P.M.	Admission	15*s.*
Thursday, May 26	8.30 A.M. to 8 P.M.	,,	7*s.* 6*d.*
Friday, May 27	8.30 A.M. to 12 NOON	,,	5*s.*
	12 NOON to 5 P.M.	,,	2*s.* 6*d.*

In no circumstances can admission be gained at any time on Tuesday, May 24, or before 12 noon on Wednesday, May 25.

Admission of Children – Children under five years of age cannot be admitted. The charge for the admission of children of five years and over will be the same as for adults.

Parties – No reduction in the price of admission can be made for parties of visitors, but tickets may be obtained beforehand to save trouble on arrival. Application, accompanied by a remittance to cover the cost of the tickets required, should be made to the Secretary, The Royal Horticultural Society, Vincent Square, London, S.W. 1, early in May. Such applications *must* reach the Secretary not later than the first post on Friday, May 20.

Fellows' and Associates' Tickets – A Fellow subscribing 4 guineas annually receives 1 non-transferable and 5 transferable tickets. The non-transferable ticket has a *detachable* portion which will admit only the Fellow to whom it is issued and one other person to the Private View on May 24.

A Fellow subscribing 3 guineas annually receives 1 non-transferable and 2 transferable tickets. The non-transferable ticket has a *detachable* portion which will admit only the Fellow to whom it is issued and one other person to the Private View on May 24.

A Fellow subscribing 2 guineas annually receives 1 transferable ticket. This ticket has a *detachable* portion which will admit only the Fellow to whom it is issued to the Private View on May 24.

An Overseas Fellow when on a visit to the United Kingdom can obtain a ticket which will admit him or her to Chelsea Show at all times at which it is open, including the Private View. Applications for tickets should be made to the Secretary.

An Associate receives 1 non-transferable ticket. This ticket has a *detachable* portion which will admit only the Associate to whom it is issued to the Private View on May 24.

Each Fellow's ticket, both non-transferable and transferable, will admit one person at any time when the Show is open on Wednesday, Thursday, and Friday, May 25, 26 and 27, but the non-transferable ticket may, of course, be used only by the Fellow to whom it is issued. An Associate's ticket may be used only by the Associate to whom it is issued.

Transferable tickets may not be left at the turnstiles for collection by persons visiting the Show later, but may be posted at the Post Office in Main Avenue.

Catering – It is regretted that it is not possible to provide set luncheons and teas, but buffets for the service of light refreshments will be available. There will also be separate enclosures for the service of alcoholic beverages.

Post Office & Telephones – A Post Office for the transaction of ordinary Post Office business will be found in Main Avenue, as will also several Public Telephone Boxes.

Railway Inquiries – British Railways have an inquiry bureau in the Show, situated in Main Avenue.

Band – The Band of H.M. Grenadier Guards will, by courtesy of the Officer Commanding, play each afternoon in the Ranelagh Gardens, where chairs are provided.

Cloakroom – A cloakroom at which bags, parcels, etc., may be deposited will be situated in Main Avenue.

Catalogue – An official Catalogue and Guide to the Show will be on sale in the Grounds, price 1*s.* 6*d.*

Invalid Chairs – The arrangements for the admission of invalid chairs will be as follows :

On Tuesday, May 24, Fellows and Associates in invalid chairs will be admitted between 2 P.M. and 8 P.M. on presentation of tickets for the Private View. There will be a charge of 5*s.* for each chair, and that charge will cover one attendant.

On Wednesday, May 25, no invalid chairs can be admitted.

On Thursday, May 26, invalid chairs will be admitted only between 8.30 A.M. and 12 NOON on presentation of Fellows' or Associates' tickets, or on payment of 7*s.* 6*d.* for the occupant of the chair. There will also be a charge of 5*s.* for the chair, and that charge will cover one attendant.

On Friday, May 27, invalid chairs will be admitted only between 8.30 A.M. and 12 NOON on presentation of Fellows' or Associates' tickets, or on payment of 5*s.* for the occupant of the chair. There will also be a charge of 5*s.* for the chair, and that charge will cover one attendant.

The Society cannot arrange for the provision of invalid chairs, but they may be hired from Messrs. Reselco Invalid Carriages Ltd., 262 King Street, London, W. 6. *Chair attendants cannot be supplied.*

TRANSPORT

Visitors travelling by car, taxi or coach should alight at the Embankment entrance. Visitors travelling to London will find the following Railway and Bus Services of London Transport operating from the Main Line Termini:

CANNON STREET (*Railway*). District Line direct to Sloane Square. (*Buses*) Number 13 to Charing Cross, thence by Number 11 to Lower Sloane Street, Pimlico Road.

CHARING CROSS (*Railway*). District Line to Sloane Square. (*Bus*) Number 11 to Lower Sloane Street, Pimlico Road.

EUSTON (*Railway*). Northern Line to Charing Cross, thence by District Line to Sloane Square. (*Buses*) Numbers 68 and 188 to Strand (Aldwych), thence by Number 11 to Lower Sloane Street, Pimlico Road.

FENCHURCH STREET (*Railway*). Tower Hill direct to Sloane Square. (*Buses*) Number 10 to Victoria Street, thence by Number 11, 39 or 46 to Lower Sloane Street, Pimlico Road.

KING'S CROSS AND ST. PANCRAS (*Railway*). Piccadilly Line from King's Cross and St. Pancras to Leicester Square, thence by Northern Line to Charing Cross, thence by District Line to Sloane Square. Or Circle Line direct to Sloane Square. (*Buses*) Number 77 or 77A to Whitehall, thence Number 11 or 39 to Lower Sloane Street, Pimlico Road.

LIVERPOOL STREET (*Railway*). By Circle Line direct to Sloane Square. (*Bus*) Number 11 to Lower Sloane Street, Pimlico Road.

LONDON BRIDGE (*Railway*). Northern Line to Bank, thence by District Line from Monument to Sloane Square. (*Buses*) Number 10 to Victoria, thence by Number 11, 39, or 46 to Lower Sloane Street, Pimlico Road.

MARYLEBONE (*Railway*). Bakerloo Line to Paddington, thence by Circle Line to Sloane Square. (*Buses*) Number 2, 30 or 74 from Baker Street to Marble Arch, Park Lane, thence by Number 137 to Chelsea Bridge Road, Royal Hospital Road.

PADDINGTON (*Railway*). Circle Line direct to Sloane Square. (*Buses*) Number 36 or 36A to Marble Arch, Park Lane, thence by Number 137 to Chelsea Bridge Road, Royal Hospital Road.

VICTORIA (*Railway*). District Line direct to Sloane Square. (*Buses*) Number 11, 39 or 46 to Lower Sloane Street, Pimlico Road.

WATERLOO (*Railway*). Northern or Bakerloo Line to Charing Cross, thence by District Line to Sloane Square. (*Bus*) Number 46 to Lower Sloane Street, Pimlico Road.

BAKER STREET (*Railway*). Circle Line direct to Sloane Square. (*Buses*) Number 2, 30 or 74 to Marble Arch, Park Lane, thence by Number 137 to Chelsea Bridge Road, Royal Hospital Road.

A plan giving approach routes to the Show and parking places may be obtained on application to the Secretary.

NOTES FROM WISLEY

J. B. Paton

IN previous notes the genus *Rhododendron* has been discussed and without doubt this genus provides the main interest at Wisley during May when many of its representatives are to be seen on Battleston Hill and in the Wild Garden. However, there are other shrubs to be seen, and for those Fellows living on a lime soil a walk round the Gardens can reveal many which are equally at home on a lime-containing or lime-free soil. Therefore this month and next consideration will be given to some such shrubs which can be seen at Wisley.

Cytisus, the broom, and its close relatives *Genista* and *Spartium*, provide welcome splashes of colour principally in May and June. They all belong to the family Leguminosae and *Cytisus* can be differentiated from *Genista* by the fact that the seed has a wart-like eminence near the hilum (the scar left on the seed when it was detached from the wall of the fruit). *Spartium* is distinguished from the other two by its one-lipped, spathe-like calyx which terminates in five teeth; both *Cytisus* and *Genista* have a tubular or campanulate two-lipped calyx with the upper lip two-lobed, and the lower lip three-lobed.

One of the earliest brooms to flower is *Cytisus* × *praecox*, a chance hybrid between *C. albus* and *C. purgans* which cropped up in Messrs. Wheeler's Nurseries at Warminster in about 1867. It is a very distinct early-flowering shrub, with thin wiry graceful stems covered in profusion

with sulphur-yellow flowers. It commences to bloom in mid-April and continues into May as does its parent *C. purgans*, introduced in 1750 from Europe and N. Africa, cultivated by PHILIP MILLER at the Chelsea Physic Garden, and having exceptionally rich golden flowers carried on numerous almost leafless dark green branchlets which make a shrub 3–4 feet high.

C. albus is the white Spanish broom which grows into a considerably larger plant, often 8 feet in height, and which comes into flower in May. It is a really genuinely hardy white broom from Spain and Portugal (it also was cultivated by PHILIP MILLER), which is easily raised from seed, whereas the others just mentioned are best raised from cuttings taken in August and placed in a cold frame. When they are rooted they should be potted off and grown on in pots until large enough to plant out. Early planting is essential as large plants do not move easily. *C.* × *beanii* is another chance hybrid, with *C. purgans* as one parent and *C. ardoinii* as the other. Its semi-prostrate dwarf habit is inherited from *C. ardoinii* which itself grows to a height of only 8 inches in its native home in the Maritime Alps. The deep golden-yellow flowers are produced either singly or in pairs or in threes at each joint of the previous season's growth. Another hybrid of dwarf habit is *C.* × *kewensis*, raised like *C.* × *beanii* at Kew, from the cross *C. ardoinii* and *C. albus*, and producing its creamy-white flowers in a similar fashion. Both these hybrids may be seen in May on the Rock Garden and also in the Alpine House, while *C.* × *praecox* grows in the border which divides the Rock Garden from the Wild Garden, and *C. purgans* is planted with the collection of brooms kindly given to the Gardens by Messrs. Underwood Bros. of West End, Woking. This collection is situated between Battleston Hill and the Model Fruit Gardens and mainly consists of varieties, in a wide range of colours, of *C. scoparius*, the common or Scots broom. In the yellow shades there are the fine ivory-white, pale yellow-winged 'Cornish Cream' raised by MR. P. D. WILLIAMS at Lanarth, the attractive yellow, buff-winged 'Mayfly,' the smaller-growing 'Diana' with cream standard and yellow wing, the neat habited, rich golden 'Newry Gold,' the lemon-yellow 'Knap Hill Lemon,' and the upright-growing primrose-tinted 'pallidus' also called 'Moonlight.' The variety 'Lord Lambourne' has a primrose standard and a dark red wing, the low-spreading 'Newry Gold' has flowers in shades of cream and rose, and 'Plantagenet' has been listed under the colours of canary-yellow wings and damson-pink standards. Those in which red predominates are the free-flowering venetian-red 'Burkwoodii,' the gold-laced red-winged 'Mrs. W. A. Slocock' with purple standards, the stiff-branched ruby-red 'Windlesham Ruby' and the upright-standing mahogany-red 'Garden Magic.' Other colours are represented by the purple-rose 'Enchantment,' the early-flowering 'Fairy Queen' in lilac-white and reddish-brown, and 'Hookstone' in which lilac and orange are the predominant colours.

Cytisus battandieri, to be seen on Weather Hill, is a comparatively recent introduction to this country, having been brought from the High

Atlas Mountains of Morocco in 1922. Although at first not thought to be fully hardy it is now considered to be hardy in Southern England. In foliage *C. battandieri* is the most remarkable of all brooms, with leaflets unusually large and covered with silvery down giving the effect of shot silk. The flowers are carried in erect racemes 5 inches long with each flower being ½ inch wide and fragrant. It is unfortunate that it sets seed so rarely in this country.

The genus *Genista* provides the garden with many useful shrubs which bloom over a season from May till July. They are mostly deciduous and are found mainly in Europe with a few from Western Asia and the southern shores of the Mediterranean. These plants like a light well-drained soil in a sunny position and are best raised from seed although cuttings can be rooted in sand frames in July and August. Like *Cytisus* the plants are best set out in the young stages. *Genista lydia*, found by DR. W. B. TURRILL growing on limestone rocks in Bulgaria, is an attractive plant for the rock garden. The bright yellow flowers appearing in May and June are carried on sub-terminal racemes which are supported on spine-tipped slender arched shoots. Also flowering at the same time is *G. sphaerocarpa* with erect slender stems which usually are covered with a mass of tiny blossoms which are succeeded by curious globose pods. This species is a native of N. Africa and Spain, while from Trebizond comes *G. patula* which MR. E. K. BALLS introduced in 1933. He reports that it likes a hot sunny position on the face of limestone cliffs although he also saw it growing on the fringes of the woods of *Picea orientalis*. It has bright golden blooms ¼–⅜ inch long and produced in such profusion that they almost hide the stems and the rather sparse foliage. *Genista virgata*, the Madeira broom, to be seen in the Wild Garden, is one of the few shrubs from Madeira which is really hardy in this country. It was brought to England in 1777 by FRANCIS MASSON on his return from a five-year plant-hunting trip to the Cape of Good Hope, organized for the Royal Botanic Gardens at Kew. A profusion of bright yellow flowers is carried from June till July, whilst an occasional flower appears as late as October. Closely allied and probably only a geographical form is *G. cinerea* a native of S.W. Europe and especially Spain. It likewise flowers in June and July and is distinguished from *G. virgata* by the longer, more slender branchlets, its less twiggy habit when old and by its flowers mostly being produced in small lateral clusters instead of in racemes. The dwarf-growing Spanish gorse, *G. hispanica*, commences to flower in mid May and continues into June. It makes a dense cushion-like shrub 1–1½ foot high with branches interlacing, spiny and hairy, and covered with rich golden-yellow flowers carried in rounded clusters 1 inch across. The latest-flowering broom of them all is the wonderful graceful Mount Etna broom, *G. aethnensis*, a native of Sardinia and Sicily, which reveals its golden-yellow petals in late July and early August, and so is a valuable acquisition to any collection of flowering shrubs. It is a tall-growing plant useful for planting at the back of shrubberies, for being practically devoid of foliage it does not

shade lower-growing shrubs. *Spartium* is a genus with only one species and *S. junceum* is a rather gaunt shrub which grows to 10 feet in height if not checked but which if judiciously pruned in the young stages will make a dense bush with erect, reed-like shoots. Plants treated in this manner, and planted 1½–2 feet apart, will quickly form a good hedge. Yellow flowered and deliciously fragrant it is a native of the Mediterranean region and the Canary Islands.

PLANTS OF INTEREST AT WISLEY DURING MAY

LABORATORY WALLS

Ceanothus rigidus
Clematis montana var. *rubens*
" " var. *wilsonii*
Rosa odorata gigantea 'Belle Portugaise'
Tree Paeonies

WILD GARDEN

Cornus florida var. *rubra*
Enkianthus species
Fothergilla monticola
Kalmia latifolia
Magnolias in variety
Meconopsis species
Paeonia delavayi
" *lutea* var. *ludlowii*
Primulas in variety
Rhododendrons in variety
Styrax japonica
Trillium species

AWARD OF GARDEN MERIT COLLECTION

Prunus padus var *watereri*
Viburnum carlesii

SEVEN ACRES

Barberries in variety
Cornus nuttallii
Erica arborea var. *alpina*
" *australis*
Exochorda species
Flowering Cherries
Halesia carolina
Laburnocytisus × *adami*
Magnolia cordata

ROCK-GARDEN AND ALPINE HOUSE

Aubrieta in variety
Corydalis nobilis
" *wilsonii*
Cyclamen repandum
Daphne cneorum var. *eximia*
Erinacea pungens
Haberlea ferdinandi-coburgi
Lithospermum diffusum
Oxalis adenophylla
" *enneaphylla*
Phlox stolonifera 'Blue Ridge'
Primulas in variety
Ramonda nathaliae
Saxifrages in variety
Tiarella cordifolia
" *wherryi*

HOWARD'S FIELD

Lilacs in variety
Roses in variety

WEATHER HILL

Cercis siliquastrum
Flowering Cherries
" Crabs

BATTLESTON HILL

Flowering Cherries
Kurume Azalea Garden
Magnolias in variety
Primulas in variety
Rhododendrons in variety
Trial of Deciduous Azaleas
" Hardy Hybrid Rhododendrons

THE UNIVERSITY BOTANIC GARDEN, CAMBRIDGE

J. S. L. Gilmour, M.A., F.L.S.

(*Lecture given on November* 2, 1954; COL. F. C. STERN, M.C., O.B.E., F.L.S., V.M.H, *in the Chair*)

THE CHAIRMAN, in introducing the Lecturer, said: It is a great pleasure to me that the Council asked me to take the Chair for my good friend MR. GILMOUR. As you probably know, MR. GILMOUR has had a very distinguished career. I think it was in 1931 that he became Assistant Director of Kew, and then, after the war, he became Director of Wisley in 1946. In 1951 he became Director of the University Botanic Garden at Cambridge.

MR. GILMOUR has written some very charming books. I read with the greatest pleasure a book by him on wild flowers which was published recently. Another of his books, a smaller one, is on one of my pet subjects—flowers on lime and chalk. I have known MR. GILMOUR very well, we have been to a number of conferences together, and I have always enjoyed his company. I know that we shall all enjoy his lecture, which is on the University Botanic Garden, Cambridge.

J. S. L. GILMOUR: I should like first to say what a very great pleasure it gives me to have COLONEL STERN in the Chair. I feel that I must not miss the opportunity, on behalf of myself and of a large number of other horticulturists, of paying a tribute to his help, friendship and knowledge over a period of nearly twenty-five years. When I was at Kew and later at Wisley and, now at Cambridge, he has always been at hand to help and advise, and to supply plants from his wonderful garden at Highdown.

My subject this afternoon is the University Botanic Garden at Cambridge, and I think that it might be interesting to start with a word or two about botanic gardens in general and their history, so that you may see the Cambridge Garden in its true perspective.

I suppose I ought to start by posing the question: What is a botanic garden? And, like so many definitions, it is not at all an easy one to make. Probably the most succinct definition is a couplet in a poem on, I am afraid, the *Oxford* Botanic Garden, published in 1713 in a rare little book, *Vertumnus*, by one ABEL EVANS, who was a poetaster of the time:

> "Delightful scientifick Shade!
> For Knowledge, as for Pleasure made."

I feel that this couplet sums up admirably the twin aims of a botanic garden—to be useful and to be beautiful. Despite the fact that it is

from Oxford, we are thinking of having the couplet inscribed over the new entrance to the Cambridge Botanic Garden that we hope to construct shortly!

This is all very well for a poetic definition, but a more prosaic one might perhaps be that a botanic garden is an establishment containing a comprehensive collection of plants, grown primarily for their botanical or medical interest, rather than for their horticultural merits. I think one should emphasize the word "comprehensive," because everyone would agree that the aim of a botanic garden should be to have as complete a collection of plants as possible.

If one accepts this definition, what is the history of botanic gardens, and when was the first one made? I shall leave out of account the ancient world—China, Egypt, Babylon and Greece—for that is a subject on its own. Considering the modern world, the first botanic gardens, as one might expect, started in Italy, as part of the general movement known as the Renaissance, in the early sixteenth century. The first modern botanic garden was founded in Pisa, in the summer of 1543. I could not have said this so definitely a few months ago, but at the Paris Botanical Congress there was an interesting paper read by an Italian botanist who had studied the original documents and had settled a long-standing controversy as to whether Padua or Pisa could claim priority. He proved definitely that the botanic garden at Pisa was the earlier, being founded in the summer of 1543, and that it was followed two years later by Padua in the summer of 1545, Padua in turn being followed by Florence in December of the same year.

As with other movements of the Renaissance, the founding of botanic gardens spread gradually north and west, and by 1600 several were established in Europe: one at Montpelier in France; two at any rate in Germany, at Breslau and at Heidelberg; two or three more in Italy, including one at Bologna; and one in Holland, at Leyden, founded in the 1590's.

What were these early botanic gardens like? The garden at Leyden was a typical example. This was laid out by the great botanist CLUSIUS, and, just to confuse posterity, he had as a helper a horticulturist called CLUTIUS. Like all early botanic gardens, it was primarily medical in purpose and extremely formal in layout. The size was about 40 yards by 40 yards, with rectangular beds growing mostly medicinal plants. There was a house where tender plants were put in the winter, but it was not a glasshouse, for these did not come in until about a hundred years later.

The movement for the founding of botanic gardens, as I have said, spread north and west, and it was only a matter of time before it reached the British Isles. The first botanic garden in Britain was not, I am afraid, at Cambridge, but at Oxford! It was founded in 1621, on the same site as it occupies today, and it is, therefore, historically one of the most interesting botanic gardens in the world. The establishment of it was largely due to LORD DANBY, who arranged that the University

should rent the land from Magdalen College. The magnificent gateway, which still stands, was designed by INIGO JONES and put up in 1632. I will not say more about the Oxford garden; I hope that most of you know it, and the fine work that it is doing for botany and horticulture.

The next botanic garden to be founded was at Edinburgh, in 1667. It began on a tiny plot of land about half the area of this Lecture Room in the grounds of Holyrood Palace. A plot this size did not, of course, suffice for very long; there was a succession of moves until the garden reached the magnificent site to the north of the city which it occupies today.

Soon afterwards, the famous Physic Garden at Chelsea was founded, in 1673, and, as you know, it is still on the same site, an oasis of horticultural interest in the heart of London.

After 1673 there was a long gap, corresponding more or less with a blank period in British botany in general—the period after the death of the great JOHN RAY and before the Linnaean system began its long reign towards the end of the eighteenth century. No other botanic garden was founded until 1759, which was the date of the foundation of Kew. I need not, I am sure, say anything more about that justly famous institution. Almost a twin with Kew came the botanic garden at Cambridge. It is always difficult to decide on an exact date for the foundation of any botanic garden—there are so many moves in the game, the choice of the site, the acquisition of the land, the planning of it, the planting of the first tree, the official opening. All these take some time and, as regards Cambridge, they extended over a period from about 1760 to 1763—just after Kew was founded further south.

Before talking about the present-day garden and our plans for the future, I will say something about the more detailed history of the Cambridge garden. I have said that it was founded about 1760, but that was by no means the first attempt to establish a garden at Cambridge. As early as 1588 a letter was drafted by the great herbalist JOHN GERARD to be sent to the University by LORD BURLEIGH, who was then Chancellor, suggesting the setting up of a botanic garden at Cambridge. That draft still lies in the Lansdowne Papers in the British Museum, and apparently the letter was never sent. I always wonder whether it is the ghost of GERARD that is saying: "By Jove, I *must* give that letter to BURLEIGH," or the ghost of BURLEIGH saying, "I *must* send that letter to Cambridge."

There was another attempt towards the end of the seventeenth century, and another early in the eighteenth century. As is so often the case with public institutions, it was a private benefactor who was finally responsible for founding the garden in the 1760's. The Vice-Master of Trinity, RICHARD WALKER, bought and presented about five acres of land to the University right in the centre of the city of Cambridge. The area was laid out largely by the then Professor of Botany, THOMAS MARTYN, but with the help of the famous PHILIP MILLER of the Chelsea

garden; and PHILIP's son, CHARLES MILLER, was appointed the first Curator.

The garden was not quite as formal as the earlier sixteenth and seventeenth-century gardens. Fig. 40 shows it in about 1815, with King's College Chapel and the famous Saxon tower of St. Bene't's in the background. The site is now occupied by the Cavendish Laboratory and a number of other University buildings.

The garden continued in its original position until the 1830's. In 1825 a new Professor, PROFESSOR HENSLOW, was appointed, who was the teacher of the young CHARLES DARWIN, and largely inspired him to go on the voyage of the *Beagle*. HENSLOW and others realized that the centre of a growing city was not the best place for a botanic garden, and they set about finding another site. In 1831 the University acquired 40 acres of land to the south of the city, but things moved slowly then, and the first tree was not planted in the new garden until 1846.

Very little remained of the old garden after the 1850's, when the first of the scientific buildings was erected on the site, but one relic did remain until 1932. This was a magnificent tree of *Sophora japonica*, closely surrounded by laboratory buildings—the last living reminder of the old botanic garden. There is, however, an old stone arch from the garden built into the fabric of the Cavendish Laboratory, and the iron gates to the old garden were erected in 1909 as an entrance to the new botanic garden.

The first tree was planted on the new site in 1846—a lime tree, which still stands by the main entrance to the Garden. From that date onwards the new garden was gradually laid out and developed up till the last war, and some famous names have been connected with its history. In the original layout, of course, PROFESSOR HENSLOW had a big hand, and so did young CHARLES BABINGTON, who was later to succeed HENSLOW as Professor. One of the early Curators rejoiced in the name of MUDD, and there are several good stories told about him in MR. PRESTON'S *Short History of the Botanic Garden*, published in the Society's JOURNAL in 1940, p. 171. He was rather a fierce gentleman and a keen smoker, but there was a strict rule in the garden that none of the staff could smoke. MR. MUDD did not reckon that this rule applied to him, and he used to stump round the garden puffing at a pipe, but if he saw anybody else smoking he roared out at him to put out that so-and-so pipe.

MUDD was succeeded by the much more famous R. IRWIN LYNCH. He was Curator from 1879 to 1919, and was the introducer and raiser of a number of interesting plants, including the modern hybrid gerberas, which he raised from two or three wild species from South Africa. We still have growing in front of one of the houses the original plants of *Gerbera jamesonii* with which he worked fifty or sixty years ago.

In 1919 LYNCH was succeeded by MR. F. G. PRESTON, who is well known to every Fellow of the Society. He retired in 1947, to be succeeded by the present Superintendent, MR. R. W. YOUNGER.

A little earlier, the University decided to appoint a Scientific

Director as well as a Curator, and MR. H. GILBERT-CARTER became the first Director of the Garden in 1921. He retired four years ago after thirty years of botanical work and teaching which has endeared him to hundreds of his pupils all over the world.

That, very briefly, is the history of the development of the Garden until the last war. Just before this an event happened which has changed the whole outlook and prospects of the Garden. In 1935 the late MR. REGINALD CORY left in his will a large sum of money to the Garden, but it was not until 1943, for various reasons, that the full value of the bequest was known, namely nearly half a million pounds. MR. CORY was a Trinity man and had been a very good friend to the Botanic Garden during his lifetime. He was a well-known amateur horticulturist, and had a magnificent garden in South Wales. This bequest has, of course, enabled us, as from the end of the war, to carry out a great many developments and improvements about which I will tell you in a moment.

Before doing so, I will say a few words about the layout and functions of the Botanic Garden as it is today. Forty acres were acquired in 1831, and it was the original intention to lay out the whole area as a garden. I have a plan in my office showing the proposed design but I suppose there was not enough money, so it was decided to lay out only half the area, twenty acres, and to turn the remaining twenty acres into allotments.

In this old part of the Garden there is a lake with a mound on a promontory, built up from the material dug from the lake. The whole of the rest of the area is very nearly level, as you would expect in Cambridge, and this is, of course, a great handicap when trying to design a garden; but I think everyone would agree that those responsible made a very successful job of an unpromising site. The soil is dry, gravelly, rather limy, very light, and dries quickly, which has great advantages and also great disadvantages. The rainfall is low (average 22 inches). There is normally plenty of sunshine in the summer, and most of the rain falls in the winter. This means that we can grow certain types of plants extremely well—for example, plants from the Mediterranean, Western Asia and California—but it completely cuts out a large number of plants, like rhododendrons and other Ericaceae, except in specially prepared beds.

There is a range of glasshouses running east and west, with a long corridor and the separate houses running southwards from it at right-angles (Fig. 39). This plan provides a number of south-facing "bays" between the houses in which many tender plants flourish in the open. The original block of houses was built in the 1860's, the present range being erected in 1880 and rebuilt in the early 1930's through the generosity of MR. W. J. COURTAULD (Fig. 43).

The "old" rock garden, as we now call it, was laid out in the 1860's, and is, I believe, one of the earliest rock gardens of its type in the country. There is an area occupied by beds for teaching purposes where herbaceous plants are arranged in botanical order according to their

families. Round the edge of the Garden, and in a number of places in the centre, is a collection of trees and shrubs, also arranged systematically. At the eastern side there is a pinetum, but, as became evident some time ago, most conifers do not do very well in the Botanic Garden and eventually we hope to start a new pinetum in another corner of the Garden where there is a slightly deeper soil.

It would take too long to describe in detail the various collections and notable individual specimens that help to give interest and beauty to the Garden, but I will mention one or two. From March until May the National Species Collection of tulips makes a fine show, starting with the minute *T. graminifolia* from Japan; and finishing with the red-flowered *T. sprengeri*; in all we have about sixty species. In an adjacent bed there is a collection of European ground orchids growing in six different types of soil, and we are building up a further assemblage of these in pots in the glasshouses; two or three species of the Mediterranean *Serapias* have survived two winters and flowered in the open bed.

There are many fine individual specimens of trees and shrubs in the Garden. Perhaps the most striking when flowering in May, is the hundred-year-old Judas tree (*Cercis siliquastrum*) which has developed several main trunks; these spread out from a central point, arching down to the ground and turning up again, the whole area covered by the tree being about 60 feet in diameter. Among the conifers the most interesting specimens are probably the *Pinus gerardiana* near the "old" rock-garden, and the *P. monophylla* by the main lawn. The thicket of the North American pawpaw (*Asimina triloba*) near the lake is a fascinating sight when it produces its hanging bells on leafless shoots, but unfortunately it has never fruited in the Garden. Nearby there are large colonies of the purple parasite, *Lathraea clandestina*, growing on the roots of willows (Fig. 45).

One of the most surprising spectacles in the Garden is the group of prickly pears (*Opuntia cantabrigiensis*) from Mexico, which have flourished facing south against the outside of the glasshouses for more than fifty years—and there are many other tender plants, such as *Erythrina crista-galli* and *Bauhinia yunnanensis*, occupying the adjacent "bays" mentioned above. In the houses themselves there are species from every quarter of the globe, including many quite large trees in the Palm House and Temperate House, and we try to maintain good specimens of the most important economic plants such as coffee, tea, rice and rubber.

One cannot talk about a botanic garden without mentioning *Metasequoia*! Our specimen by the lake, grown from seed sown in 1948, is now about 16 feet high, which places it, we like to think, among the tallest in the country.

What does the University Botanic Garden at Cambridge set out to do? Its main functions, naturally, have always been, and must always be, botanical teaching and research.

As regards teaching, our main task is the supply of botanical specimens to the Botany School, which is over half a mile away. We send them about 40,000 specimens a year, and, of course, the students are brought to the Garden to see the plants about which they hear in their lectures living in their more or less natural setting. This teaching aspect has its own special problems. If one has to supply specimens from a particular bush year by year to a class of eighty or ninety students, it is not very good for the bush! One of the points mentioned in MR. CORY'S will was that he hoped some of the money would eventually be used for growing plants specifically for teaching purposes in a special part of the Garden, or even outside the Garden altogether, so that the specimen bushes and trees in the Garden would not be mutilated every year, and we hope in due course to be able to do this.

For the last sixty years or so the Garden has been a centre of botanical research at the University. For example, some of the most important pioneer work in plant genetics was carried out on plants growing there. BATESON, MISS SAUNDERS, PUNNETT and HURST all used the Garden for growing their material. Research on plant diseases was also carried out by PROFESSOR BROOKS and others, and physiological work by F. F. BLACKMAN, PROFESSOR BRIGGS and others. This aspect of our work is one that we are expanding with the aid of the Cory bequest.

Our third main function is the training of young gardeners. I need not say very much about this since most of you probably know the "student-gardener" scheme which operates at Kew, Wisley, Edinburgh and Cambridge. As I have said before in this Hall, it is a most excellent scheme, from the point of view both of the trainees and of the Garden. It would obviously be extremely difficult to run a botanic garden in a relatively small city like Cambridge unless one could draw on labour from all over the country. Our student gardeners come from England, Scotland, Wales, Ireland, and from overseas, too. They stay for two years and receive a certificate when they leave. From the point of view of the trainee, the scheme provides a combination of actually working for a wage in the Garden with more formal training such as lectures and demonstrations.

Lastly, one of our functions is to be a park for the city of Cambridge, although access to the Garden by the public is a matter of "grace" and not of "right." The Garden is open to the public free every day of the week from 8 A.M. until dusk or 8 P.M., except on Sundays, when it is open to key-holders only. The problem of combining the function of a park and a botanic garden is, of course, not nearly so acute at Cambridge as at Kew, with its enormous number of visitors each year, but nevertheless it exists in the shape of prams, dogs, picnics and other such matters. On the whole, however, the public causes very little trouble and we are glad to welcome as many as may wish to come.

Before talking about our plans for development and expansion, I want to refer to one very important aspect of botanic garden work, namely, the identification of the plants in it, and their correct naming,

recording and labelling. Plant names are tricky things, and I hope the Chairman will forgive me if I recount a little story to illustrate how dangerous it may be to give names to plants lightheartedly and without due thought. The story, which is quite true, concerns an occasion a year or two ago when I was being shown round a collection of chrysanthemums in company with the head of a highly respected seminary for young ladies, which we will call Ferncroft. The owner of the chrysanthemums was pointing out the various varieties, when he turned to the head of the college and said: "Oh, by the way, do you go in for 'Chastity' at Ferncroft?" "No," she replied. "We prefer 'Felicity'—we get it every year from Mr. ——."

We do not have quite this kind of problem at the Garden, because most of our plants are species, whose names are, perhaps, a little less dangerous, though none the less fraught with difficulties! Like any botanic garden, of course, we have always kept a record of every new plant that comes in, whether as seed or in any other form. During the last year or two we have been trying in addition to keep records of when material germinates, when it is pricked out, and where it finally goes in the Garden. This means a great deal of work, but I think that in the end it is worth while. We have also, with the help of a recently appointed taxonomist, started making herbarium specimens and a card-index of all the plants in the Garden, coupled with (we hope!) their correct identification. This is a job that cannot be done unless there is a special man to do it, as I think everybody connected with botanic gardens would agree. It is not always easy to persuade the authorities of a garden, whether national or university, to appoint such an officer, but that is one of the many benefits made possible by the Cory Fund.

I come now to the question of how we are spending the Cory bequest, and how we hope to develop the garden with its help. Obviously one of the main tasks is to take in the twenty acres of allotments which originally formed part of the botanic garden area over a hundred years ago, and we have now done about two-thirds of the clearing involved. We have in all about four and a half miles of mature hedges to pull down, coupled with a large number of fruit trees, sheds and every other conceivable object that may accumulate on sixty-five allotments in a hundred years! We have done all this clearing ourselves under the supervision of MR. YOUNGER, with student-gardener labour. The student gardeners pull up the hedges with a winch worked from a tractor.

One of the first features that we have laid out in the newly cleared area is a Winter Garden. Our aim is to have an open-air garden which will be a blaze of colour on Christmas Day! I will not enumerate all the plants that it contains—no doubt you can imagine some of them. They include plants that will be in flower, in fruit, and plants that have coloured barks. The garden is surrounded by a mixed hedge with eight different sections each composed of a common evergreen hedging plant. Each section is separated by a fastigiate conifer which will grow

to 20 or 30 feet. Our idea is that those thinking of planting a hedge can come to one spot and see a wide range of evergreen hedging plants growing side by side under comparable conditions.

Other features that we are planning include a new herbaceous border about 120 yards long, and two new entrances, one near the new herbaceous border, which ought to make a fine welcome to visitors. From the same entrance there will be a vista, outlined by groups of trees, running right across the new and the old areas of the garden which will thus link the two together into a single whole.

There will also be an ecological area, with different sections for growing British plants in their natural settings—a chalk area, a damp area, an area for maritime plants, a woodland area, and so on—and a series of beds to help in the teaching of experimental taxonomy, a bed of hybrids with their parents, of ecotypes within species, and of different chromosome "races" to show the effect of change of chromosome number.

On the other side of the new area from the vista we are going to have an avenue about 400 yards long composed partly of trees that grew in Europe before the Ice Age—a sort of "Tertiary Avenue." Lastly, we are planning an area for medicinal and poisonous plants laid out on the design of a sixteenth-century herb garden of the kind that you see in so many of the early gardening books, and an iris garden which will be stocked in the first instance by a selection of the magnificent collection made by the late MR. C. P. RAFFILL at Kew, which we purchased after his death.

In the old garden we are also able to make quite a number of improvements with the Cory Fund. In addition to building a new laboratory, experimental glasshouses, a mess-room, a meeting-room and a library, we are constructing a new rock garden round the lake. It is to be in two sections, a sandstone section which is now finished, and a much larger limestone section, using in all about 500 tons of rock. The sandstone is from Sussex and the limestone from Westmorland. We are doing all the work with our own student-gardener labour under the Superintendent's supervision. One of the great advantages of this section is that the soil we have used is a mixture of peat and loam, so that we can now grow lime-hating plants for the first time on any large scale in the Botanic Garden. The limestone section on the other side of the lake is growing rapidly, and Fig. 42 shows student gardeners laying some of the stones in the scree. The plants in the limestone section will be arranged geographically. Later we hope to have a series of streams and waterfalls running down into the lake, and to construct the only artificial "doline" in the country. This is the geological name for a swallow-hole, of the type that one sees in limestone country, especially in the Karst region of Yugoslavia. We hope to grow in it some of the special plants peculiar to this habitat.

In this talk I have been able to give you only a brief outline of the history of the Garden and of the future developments that we are

planning. I can only say that I hope you will all come to Cambridge and see the Garden for yourselves.

The CHAIRMAN: We have listened to an extremely interesting lecture about the past, the present and the future of the University Botanic Garden at Cambridge. I must say that I envy the Director having another 20 acres to design and to plant. What a lucky fellow he is to have that to do! And how well he is doing it!

There was one thing that struck me in the pictures. I am not sure when MR. MUDD lived, but I think it was a picture of the period 1864 to 1878; did you notice that all the tools that they were using were exactly the same tools as we use today?

As regards the *Metasequoia*, we are all wondering who has the biggest, but just for fun I planted one as a very small plant on chalk down, and it is very nearly as big as the one in the picture shown by MR. GILMOUR. Many of us thought that it wanted a wet place, but it certainly seems to be quite all right on a dry one.

On your behalf, I should like to thank MR. GILMOUR very much for his excellent and inspiring lecture.

THE ROYAL HORTICULTURAL SOCIETY AND THE SCIENCE OF GENETICS

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GENETICS, the science of heredity in micro-organisms, plants, animals and man, in its development owes a good deal to the activities of The Royal Horticultural Society. And so it seems a welcome opportunity for geneticists to give a vote of thanks to the R.H.S. in the year in which it celebrates its sesquicentenary.

From its beginning as the Horticultural Society of London, it has promoted scientific research on behalf of horticulture. Under the stimulating guidance of THOMAS ANDREW KNIGHT, who entered upon the duties of its President in 1811 and kept this office until his death in 1838, a great many members became interested in the scientific and practical problems of horticulture. We may quote here a few lines from the introductory paper, read by KNIGHT before the Society on April 2, 1805: "The Physiology of vegetation has deservedly engaged the attention of the *Royal* and *Linnean* Societies; and much information has been

derived from the exertions of those learned bodies. Societies for the improvement of domestic animals, and of Agriculture in all its branches, have also been established, with success, in almost every district of the British Empire. Horticulture alone appears to have been neglected, and left to the common gardener, who generally pursues the dull routine of his predecessor; and, if he deviates from it, rarely possesses a sufficient share of science and information to enable him to deviate with success." Further: "We may therefore infer, with little danger of error, that an ample and unexplored field for future discovery and improvement lies before us, in which nature does not appear to have formed any limits to the success of our labours, if properly applied."

As a first result the Council decided to publish a series of periodical volumes, containing the results of the Society's members in horticultural studies; in the *Book of the Royal Horticultural Society* (1863, p. 11), we find this statement: "In 1810, the first number of the Horticultural Transactions made its appearance, a publication which ultimately extended to ten 4to volumes, replete with Horticultural information both theoretical and practical of the highest value, and from which writers on gardening subjects have not failed to extract a large part of their knowledge. The cost of publishing these deservedly celebrated volumes had in 1830 amounted to 25,250 £; and they were not finally discontinued until the year 1848." The interest roused by these publications among horticulturists, is clearly proven by the fact that the first three volumes have been reprinted in later years.

For genetics, Volume V of these Transactions especially is of great value; it contains three communications on results in crosses of peas, which are of outstanding importance as pre-Mendelian genetical studies.

In a communication read at the meeting of the Society on August 20, 1822, ALEXANDER SETON mentioned the results of a cross between the green-seeded pea 'Dwarf Imperial' and the pollen of a white free-growing variety. The plants grown from these seeds were more or less intermediate between both parents, but the seeds from these plants behaved differently. "On their ripening it was found that instead of their containing peas like those of either parent, or of an appearance between the two, almost every one of them had some peas of the full green colour of the 'Dwarf Imperial,' and others of the whitish colour of that with which it had been impregnated, mixed indiscriminately and in undefined numbers; they were all completely either of one colour or the other, none of them having an intermediate tint." One of the pods, represented by SETON in a coloured figure, is reproduced in Fig. 44. Here we have one of the pre-Mendelian statements of Mendelian segregation, though without any further conclusion as to ratios between both types.

A second communication was made by JOHN GOSS in the meeting of October 15, 1822. GOSS had pollinated flowers of the variety 'Blue Prussian' with pollen from 'Dwarf Spanish.' The first was a type with

green cotyledons; in the second these were yellow. On ripening the ripe pods of the 'Blue Prussian' plant, GOSS saw to his astonishment, that the seeds inside the pods were yellow and not blue-green. The plants from these yellow seeds, when they were fully developed sometimes had all green peas, sometimes all yellow seeds in their pods, but in most cases the green and the yellow peas were mixed. This quotation from GOSS (1822, p. 235) is of special importance: "Last spring, I separated all the blue peas from the white and sowed each colour in separate rows; and I now find that the blue produce only blue, while the white seeds yield some pods with all white, and some with both blue and white peas intermixed."

GOSS has not only confirmed here the segregation in heterozygous plants as stated by SETON, but he observed the phenomenon of "dominance" in the first hybrid generation, while he also has proved that plants which we now call "extracted recessives" are pure of type.

It is true that GOSS's interpretation went too far; he believed that he had shown that foreign pollen should be able to impregnate the characters of seeds and says: "And if the seed undergoes such a change, why may not the fruit?" And so he believed that he was entitled to oppose the conclusion, given by R. A. SALISBURY in 1808 (p. 105): "Not that I have a shadow of doubt of the important consequences which ensue, when the *Stigma* of one plant imbibes *Pollen* belonging to another; but these are only manifested in the *succeeding generation*."

It was against this erroneous conclusion by GOSS that T. A. KNIGHT made his stand. In 1823 KNIGHT described a hybrid made by himself between a pea with white flowers with uncoloured seedcoat and green stems, and a pea in which the flowers and stems were violet and the seedcoat was grey. The seed obtained from this cross absolutely resembled the colourless mother plant, but from this hybrid plants grew up which, in some respects had more of the external appearance of the father plant. The hybrids were again crossed with a plant of the white type, which resulted in a certain number of white plants in the offspring of this back-cross. KNIGHT does not state the ratio between these white plants and the total, but he did establish that the first hybridization of the white with the purple plant gave only a purple-flowered offspring, and so he confirmed the principle of "dominance." In his discussion he pointed to the essential difference between the seedcoat which is a character of the mother plant, and the cotyledons, which indeed belong to the next generation. And by this KNIGHT cleared up a misunderstanding which in later years still frequently can be observed in horticultural literature.

The Royal Horticultural Society has gained great credit by faithfully continuing this tradition; the activities of its laboratories in Wisley Gardens are the best proof for this statement. From a genetical point of view we may appreciate the recent work by DR. JANAKI AMMAL on polyploidy in the genus *Rhododendron* and her other chromosome studies (*Nerine*, *Nicandra*, *Philadelphus*, *Saccharum*) and the investiga-

tions by MR. D. E. GREEN with a view to breeding rust-free strains in *Antirrhinum*.

The services rendered by The Royal Horticultural Society to the Science of Genetics are found also in another direction. In 1899 (July 11–12) she organized an international conference on hybridization in plants, which became the successful starting-point of a series of international genetical congresses. The success of this conference was certainly for a part due to the stylish direction by the Society's President, SIR TREVOR LAWRENCE, and to the activities of its Secretary, the REV. W. WILKS. But before all, its success was the result of the Society's spirit, grown out of the scientific tradition established already in its early years under the influence of T. A. KNIGHT. The Society had understood that such a conference not only should be open to practical horticulturists, but that also scientists should play a prominent part in its programme. So we meet as Presidents for the two days the famous botanists M. T. MASTERS and G. HENSLOW; so we find among the list of lecturers the scientists W. BATESON (Fig. 46), HUGO DE VRIES, C. C. HURST, H. J. WEBBER, J. W. WILSON, R. A. ROLFE, and others.

Before all it was BATESON who in his lecture (1899) on "Hybridization and Cross-breeding as a Method of Scientific Investigation," with a prophetic eye, designed a programme of research that for a number of years should give a lead to numerous fellow-botanists. He considered the problems of hybridization from a high plane; he did not restrict this concept to species-hybrids, as was generally done, but he pointed to the great scientific importance of hybrids between varieties. In his discussions he even involved the inheritance of the various kinds of combs in fowl and by that he freed the problem of hybridization from its specific botanical character. He showed that the ultimate solution of the problems of heredity, of the species concept and of evolution can be approached along the ways of studies on hybridization. And by that BATESON raised this Conference on hybridization in plants to the higher level of a general genetical congress. BATESON's broad-minded spirit looks the more admirable, when we keep in mind that in the year 1899 Mendelism was still hidden in the womb of the future, the rediscovery of MENDEL's laws being reserved for the following year, 1900. Notwithstanding the fact of its limited international character (beside 130 members of British nationality, only a few foreigners were present), this Conference, organized by The Royal Horticultural Society, is now considered the First International Congress of Genetics. The interest raised by MENDEL's rediscovery occasioned the R.H.S. to republish MENDEL's original article in the beginning of Volume 26 (1901) of its JOURNAL. This was probably the first republishing of the article in any journal with a wide circulation.

A second conference was convened by the Horticultural Society of New York (Sept. 30–Oct. 2, 1902). In American style, this conference was announced to be an "International Conference on Plant Breeding

and Hybridization," the practical problems thus being brought to the front. And again it was BATESON, one of the small group of foreigners, who put the scientific stamp upon this conference. In the title of his lecture on "Practical Aspects of the New Discoveries in Heredity," he conceded a little to the American preference for practical problems, but its contents were of a purely scientific character. Shortly before Mendelism had been rediscovered and because of that, BATESON considered it his duty to expose the fundamental importance of this discovery. He was fully qualified to do so because he had at his disposal a rich experience, obtained by numerous experiments which he had made in pre-Mendelian years. And his lecture became the more stimulating because he was able to give examples of results that seemed to be unexplainable on Mendelian principles, but which nevertheless contributed much to their extension.

In 1906 The Royal Horticultural Society again organized the Third International Conference, now on Hybridization and Plant Breeding, the same subjects as those of the New York Conference, but in reversed order. And again BATESON'S personality dominated the conference as a whole; his grandiose vision foresaw the possibilities of developing this field of scientific activity. BATESON had been invited to take the office of General President for this Conference, and in this position he took advantage of the opportunity in his opening address, "The Progress of Genetic Research," to sketch a future of the study of heredity which has been completely realized. With a permissible satisfaction he stated the profound change of character in the study of hybridization since the first conference of 1899: "The predominant note of our deliberations in 1899 was mystery. In 1906 we speak less of mystery than of order." He was allowed to say so, for a great part of this development could be attributed to the new views obtained after the rediscovery of MENDEL'S laws in 1900. "Thus the study of hybridization and plant breeding, from being a speculative pastime to be pursued without apparatus or technical equipment in the hope that something would turn up, has become a developed science." "The science itself is still nameless, and we can only describe our pursuit by cumbrous and often misleading periphrasis. To meet this difficulty I suggest for the consideration of this Congress the term *Genetics*, which sufficiently indicates that our labours are devoted to the elucidation of the phenomena of heredity and variation: in other words, to the physiology of Descent, with implied bearing on the theoretical problems of the evolutionist and the systematist, and application to the practical problems of breeders, whether of animals or plants. After more or less undirected wanderings we have thus a definite aim in view."

He stresses the general biological character of this new science: "Not even the time-honoured distinction between things botanical and things zoological is valid in Genetics." The new science elucidates numerous existing but vague concepts; BATESON illustrates this by a profound discussion of the concepts of "pure-bred" and "reversion."

He shows clearly that these concepts are the deposit of the action of material units. He acknowledges with emphasis the eminent importance of this fundamental question: "But ever in our thoughts the question rings, what *are* these units that bring all this to pass, which in their orderly distributions decide so many and perhaps all of the attributes or faculties of each creature before it is launched into separate existence? . . . Wild and inscrutable the question sounds, but genetic research may answer it yet." And he gives also another outlook into the future: "It is not only the breeder of animals or plants who is concerned to know the truth about heredity. The results of genetic research affect every branch of physiological or sociological inquiry. Too long has science been content to explore the specialized and outlying functions of the body and to neglect the primary, central, and all-controlling function of heredity, on which the rest depend. Such neglect manifestly arose from the curious delusion that the laws of breeding were untraceable. With the Mendelian renascence, that dark age has ended."

BATESON found the satisfaction that this conference, announced as an "International Conference on Hybridization and Plant-breeding," expanded into a true "Genetical Congress," so that the Report of this Conference could be published under the title "Report of the Third International Congress 1906 on Genetics." He also had the satisfaction to live to see the further development of his "Genetics" until his death in 1926.

The scope of this congress indeed was much wider than that of its predecessors. A number of lectures, it is true, was devoted to the application of hybridization in horticultural practice, but a large number also treated problems, which may be considered of foremost importance for the science of genetics. This third congress of genetics has become an appreciated prototype of its successors in 1911, 1927, 1932, 1939, 1948 and 1953.

Geneticists, now a numerous crowd of scientists all over the world, will never forget to thank The Royal Horticultural Society for its fruitful initiative in starting their series of International Congresses.

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FRUIT FOR THE CONNOISSEUR

J. M. S. Potter, N.D.H.

(*Lecture given on July* 13, 1954, DR. H. V. TAYLOR, C.B.E., V.M.H., *in the Chair*)

OUR late friend MR. TOMALIN was to have given this lecture. It is not easy to give a talk on a subject chosen by someone else, and I will say at once that I would not myself have chosen this title, as I think the term connoisseur hardly applies to the eating of fruit. Nowadays most of the better varieties have become available to the vast majority of the public, and though this fact has much to recommend it, a plentiful supply of any good article tends to reduce its value to the discriminating. It is only thirty years since 'Cox's Orange Pippin' was planted commercially and only during the last ten years has this best flavoured of all apples been put on the market in ever-increasing quantities. The result is that the public has come to regard this apple as an article of diet, whereas before it was produced in such quantities it was certainly an apple for the man with a discriminating palate. How many of you present can honestly say that you have sat down to enjoy the subtle and aromatic flavour of a 'Cox's Orange' with the same anticipation as you would enjoy a bottle of claret? I should say very few. To me the connoisseur of fruits is a rarity nowadays and is that uncommon person who has cultivated a highly developed taste for quality in the good things the world of fruit can provide. To acquire such a standard both experience and knowledge are needed. Experience only comes after considerable trial and error and with time so comes knowledge.

It would be rather presumptuous of me to try to define what to expect from a fruit at its season of perfection because greater authorities than I have tried to do so without success. In dealing with such a delicate sense as the palate, particularly where fruit is concerned, it is impossible to get complete agreement on the definition of flavour. The late E. A. BUNYARD told me that between the two world wars a panel of food and wine connoisseurs met to try to assess the quality of our best dessert apples but after one or two meetings the panel was dissolved as members could not agree. However, I will tell you what I think the flavour of an apple, for example, should be. It should consist of a delicate balance between sugar and acid combined with the aroma of the ethers produced by the fruit, yielding an aromatic flavour. These three factors in their correct proportions provide a delicacy for the connoisseur. Knowledge and experience are needed to catch this delicate balance, for although a variety may be said to ripen at a particular period, colour and aroma must be assessed throughout this time so that the fruit can be eaten at its best, some fruits of any given variety reaching their peak before others.

While the gourmet will discriminate with care about the dessert fruit he eats, he does not always pay so much attention to cooking varieties or, to use an adjective seldom seen nowadays, kitchen varieties. There is as much difference between good and poor kitchen varieties as there is between good and poor dessert varieties. May I remind you that this is probably the only country in the world that makes a clear-cut division between dessert and cooking apples. Our forefathers knew what a good cooking apple was when they grew Codlins, the Hawthorndens, 'Wellington' and a host of others, which are little seen nowadays simply because their size does not conform to modern standards. The essence of a good cooking apple is its acidity combined with a slight amount of tannin. It is these chemicals which provide the tartness and therefore the character of the cooked fruit.

Elsewhere I have criticized the lack of discrimination amongst modern fruit-growers and have said that the amateur is to some extent becoming rather commercially minded, but let us bear in mind that modern science has provided us with the means of obtaining fruit over a far longer period than was possible for our forefathers. By this I mean the various methods of preserving such as bottling or canning. It is perhaps partly because of this that we are not quite so discriminating over fresh fruit. However, who would object to a well-bottled sample of 'Green Gage' in mid-winter?

With the foregoing limitations in mind, particularly that of palate, let me now give you the varieties that appeal to me. These will not be given according to season of ripening but in my own order of preference.

First of all *dessert apples*. You will expect me to start with 'Cox's Orange Pippin,' which I am going to do, but what can I say about this king of all apples that you do not already know? Although raised a hundred years ago it still remains unsurpassed for flavour, but don't eat it in September or October or keep it beyond the beginning of January. Eaten too early it is too acid and kept too late it has gone sweet and lost its aroma. Watch carefully for that delicate yellow hue to appear, which varies considerably, but combine this with the aroma and you will not go far wrong.

'Ribston Pippin,' my next choice, is said to be the mother parent of 'Cox's Orange' and seems to be rather neglected nowadays. It was supposed to be a shy cropper and susceptible to apple canker, but in my experience it is a regular cropper if a pollinator is provided and will grow satisfactorily in quite a variety of conditions. As to canker, this should not be troublesome if proper drainage is provided. However, it is the fruit we are concerned with. The appearance of this can vary tremendously, from a clear clean greenish-yellow with a crimson-red flush, to a fruit with a considerable amount of its surface covered with russet. The flesh is firm, crisper than a Cox, rich with a first-class aromatic flavour, at its best in November. 'Ribston Pippin' is often kept beyond this month but by then its true flavour has gone.

My next two varieties, 'Orleans Reinette' and 'Nonpareil,' are of a

type that the connoisseur might grow for special occasions such as for eating after dinner with a suitable wine, which seems necessary to bring out their full flavour. These varieties are not juicy enough to be satisfying when eaten mid morning or at any other time when the palate may be rather dry. In appearance 'Orleans Reinette' might be described as a small edition of 'Blenheim Orange,' being greenish-yellow with a reddish flush. I don't think I can better BUNYARD's description of the flavour as intermediate between 'Blenheim' and 'Ribston,' but whereas he says it is juicy, I consider it dry. It is in season from the end of December to the beginning of February.

'Nonpareil,' sometimes called 'Old Nonpareil,' is a very old variety, probably four centuries old. Fifty years ago it was much esteemed, yet it is doubtful if it is to be found in modern catalogues. It can be used from the end of January until May, but it is probably at its best in March. Why it has lost popularity is difficult to understand because it crops well under good conditions. Perhaps it is because the fruit is too small by modern standards and the dull greenish-yellow with thin grey-russet and dull red flush is insufficiently attractive in comparison with present-day varieties. Too many people judge an apple by its appearance and not by its internal quality. Yet here is a crisp fruit with a rich aromatic flavour of its own which surpasses for flavour any modern variety of the same season. It should, however, be grown only in the warmer parts of the country and given a sheltered site, otherwise the fruit will be too tart.

No list of high quality dessert apples would be complete without at least one russet, and my choice is 'Egremont Russet.' It is a round flattish fruit covered with golden-brown russet with a reddish flush. The flesh is firm, greenish-yellow, rather dry but with a pronounced nutty flavour of its own. It is best eaten towards the end of October and during November.

So far my remarks have been mainly confined to apples of English origin, but I now want to deal with two varieties that have been introduced from abroad. These are 'Gravenstein' and 'Mother.' 'Gravenstein' was raised in Germany many years ago and has probably been known in this country for more than a century though it is little grown today. The fruit is irregular in shape with distinct ribs. In colour it is clear pale yellow with a reddish flush, but it is the flesh which is most distinctive. This is creamy-white, very crisp and juicy, and despite its firm crisp texture breaks down and appears to melt away. The flavour is rich and aromatic. Incidentally, this variety produces very few seeds. It flowers early and requires a pollinator flowering at the same time. The fruit is at its best at the end of September and during October and should not be kept until December as suggested by some books.

'Mother,' sometimes called 'American Mother,' originated in Massachusetts and is one of the very few American varieties introduced into this country that have really succeeded. It is of Pearmain shape, golden-yellow with a brownish-red flush. The flesh is creamy-yellow,

Photo, Fox Photos Ltd.

THE UNIVERSITY BOTANIC GARDEN, CAMBRIDGE

FIG. 39—A view of the long corridor in the glasshouses (See p. 209)

FIG. 40—A view of the old garden about 1815 with King's College Chapel in the background, produced for R. ACKERMANN'S *History of Cambridge* (See p. 208)

FIG. 41—A fine group of spring bulbs for the rock garden exhibited at the R.H.S. Flower Show, March 8

Photo, J. E. Downward

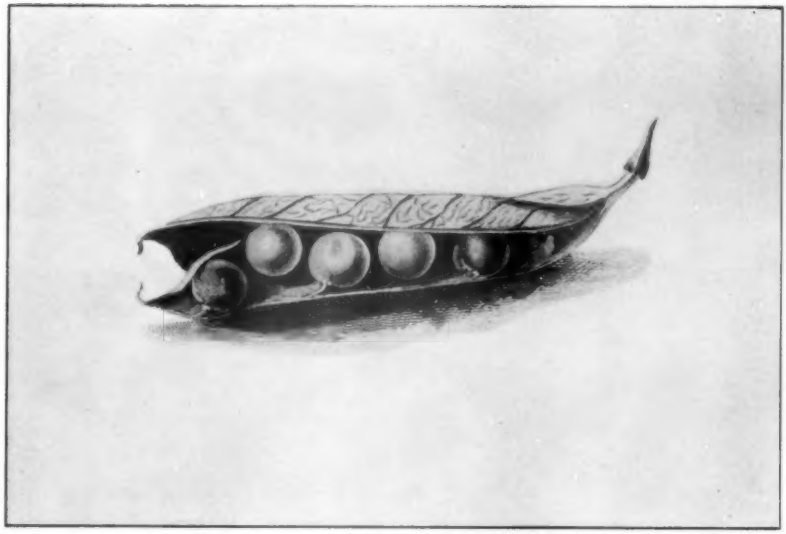
Photo, Cambridge Daily News Ltd.

FIG. 42—Student gardeners working on the construction of the limestone section of the new rock garden by the lake (See p. 213)

Photo, The Times

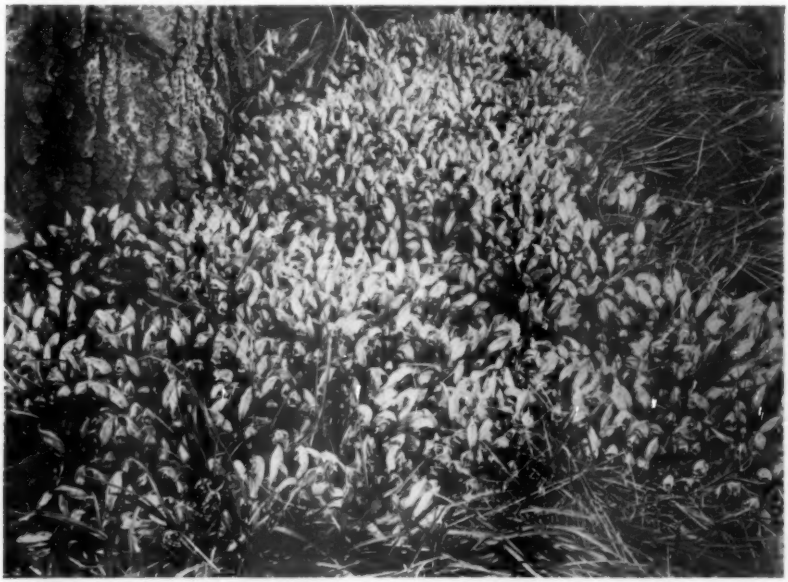
THE UNIVERSITY BOTANIC GARDEN, CAMBRIDGE

FIG. 43—A section of the old rock garden with the greenhouses in the background (See p. 209)



THE ROYAL HORTICULTURAL SOCIETY AND THE SCIENCE OF GENETICS

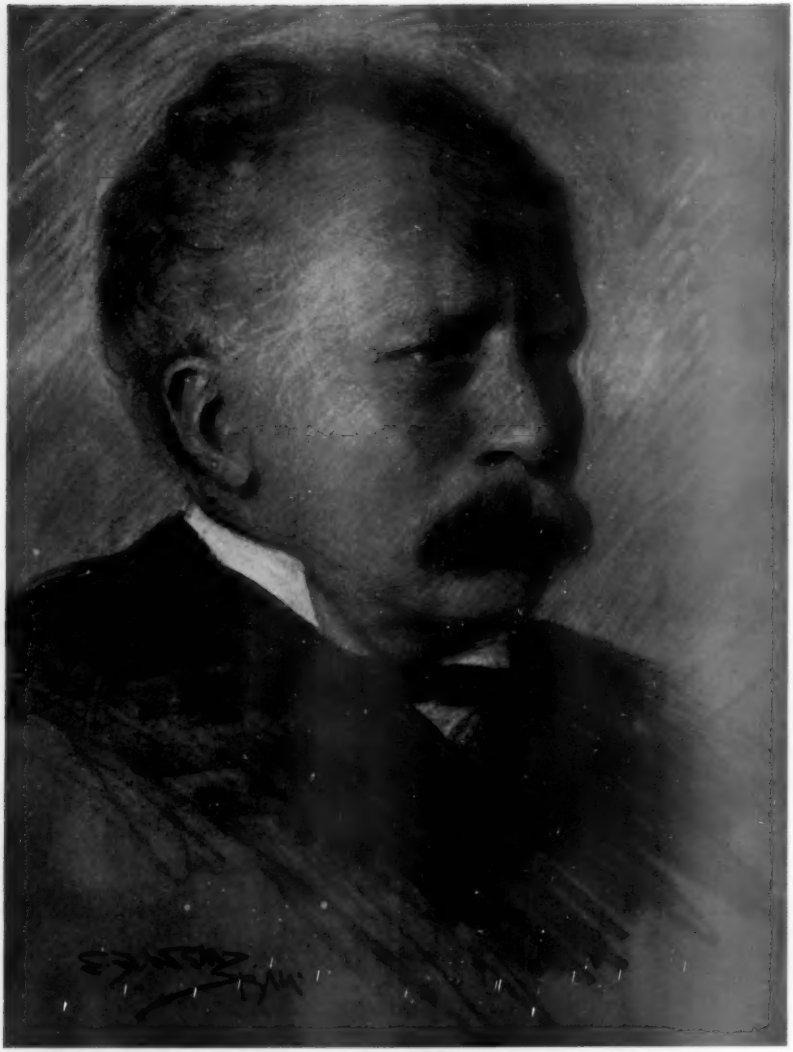
FIG. 44—A pod of peas foreshadowing Mendelian segregation, reproduced from the *Transactions of the Horticultural Society*, 1824 (See p. 215)



Photo, F. G. Preston

THE UNIVERSITY BOTANIC GARDEN, CAMBRIDGE

FIG. 45—*Lathraea clandestina* growing on willow roots in the water garden (See p. 210)



THE ROYAL HORTICULTURAL SOCIETY AND THE SCIENCE OF GENETICS

FIG. 46—A portrait of PROFESSOR W. BATESON whose lecture in 1899 on "Hybridization and Cross-breeding as a Method of Scientific Investigation" did so much to further the scientific interest in genetics (See p. 217)

A ROCK GARDEN AT GARDONE RIVIERA IN ITALY

FIG. 47—A fine thicket of *Bambusa mitis* (See p. 230)

FIGS. 48 and 49—Artificial construction to give an illusion of alpine scenery is carefully planted with a great range of alpine flora (See p. 231)

crisp and breaking but very tender with a distinctive flavour. It is one of the best apples for October. This short list of dessert apples has consisted of old or comparatively old apples, so to complete it here is a modern one, 'Laxton's Fortune.' This is without doubt one of the best apples for September. The roundish yellow fruits with a reddish flush have a tender flesh with a highly aromatic flavour which one authority says resembles a banana, although I have never been able to detect this myself.

As I said earlier, quality in cooking apples has been sadly neglected during recent years. The modern housewife appears to judge a cooking apple by two characters only, size and colour. It must be large and green. Neither of these characters gives any indication of the cooking quality of the fruit. The main character of a cooking apple should be its tartness because it is only the fairly high concentration of acid that causes the flesh to pulp or froth. The modern tendency to add some lemon juice to apples on cooking only goes to show that some of the varieties grown today lack acidity and flavour of their own.

Mention has already been made of the Codlins, Hawthorndens and 'Wellington' (sometimes called 'Dumelow's Seedling') and here are four more, two modern and two old. The old varieties are 'Blenheim Orange' and 'Allington Pippin.' The creamy-white pulp of 'Blenheim' during December can hardly be bettered for flavour, and 'Allington Pippin' in an apple-pie about Christmas-time has an aromatic flavour like that of a fresh dessert apple of high quality. The two modern varieties are 'George Neal' and 'Woolbrook Russet.' 'George Neal' is a September apple, medium large, round, flat, greenish-yellow with a slight red flush. It froths beautifully on cooking, the colour is creamy-white, and the flavour very rich. The name of 'Woolbrook Russet' suggests that it is a dessert apple, but it is actually a cooker. It is rich in acid, sugar, and all the other chemicals which combine to produce character in cooking apples. The fruit is medium large, round, dark green and goes into a pulp on cooking. This is an apple I would recommend for the small garden as it is not such a strong grower as 'Bramley's Seedling' and will keep quite as well.

It is even more difficult to define the true flavour of the *pear* than of the apple, but again it is a combination of acid—much less than in the apple—the sugars and that aroma, often called musk. These, together with the texture, which should be buttery but free from grit and should melt in the mouth like ice-cream, form the essence of quality in a pear. Besides this, the pear is a native of warmer regions than ours and for that reason the high quality varieties should be given a warm aspect and where necessary the protection and added warmth of a wall. Pears should also be stored at a higher temperature than apples and great care taken to ensure that they are eaten at the correct stage of ripeness.

The pear has been described as the queen of fruits, and the queen of queens is surely 'Doyenné du Comice.' Its season is November and

when well finished the quality is unsurpassed, the flesh being smooth and melting and the flavour delicious. This pear is too well known for further detailed description but I might just add that it requires a pollinator, and 'Laxton's Superb' has proved satisfactory.

My next choice is 'Seckle,' an older variety than 'Comice,' and very little grown today. This small roundish oval pear with its yellow-brown colouring, often with a reddish flush, has very buttery flesh, juicy and highly aromatic. It is ripe in October. 'Seckle' should not be worked direct on to quince rootstock but should be double-worked.

My next variety, 'Williams' Bon Chrétien,' is one of the few pears raised in this country—most varieties have originated in France—and is probably the most widely grown of any, being cultivated in practically every country where this delightful fruit is produced. There can be few people who have not eaten canned 'Bartlett' pears, and 'Bartlett' is another name for 'Williams' Bon Chrétien.' Little can be said about this pear that is not already known, and despite its universal popularity it is a variety appreciated by gourmet and philistine alike. 'Williams'' should be double worked in the same way as 'Seckle.'

There are quite a number of October pears, but preference for this month goes to 'Beurré Superfin.' The yellow fruit with patches of russet has pale yellow flesh which is really melting and has a delicate flavour. This is not a heavy cropping pear but under good conditions yields regularly.

There is a small number of winter pears, but the majority of these rarely finish well in this country and the only variety that can generally be relied upon is 'Joséphine de Malines.' The fruit of this variety is short, conical, greenish-yellow with russet patches. The flesh is slightly pinkish, a rather unusual colour for a pear, with a delicious flavour, melting, although it can occasionally be a little gritty near the core. It is in season during December and January, and unlike most varieties of pear the fruits ripen in succession so that it can be eaten over a period of several weeks. 'Joséphine de Malines' sometimes tends to overcrop and when this happens the fruit should be thinned, otherwise the full flavour will never develop.

The last variety in this short selection is one which was raised in the United States by crossing 'Williams' Bon Chrétien' with 'Joséphine de Malines.' Its name is 'Gorham' and it ripens after 'Williams',' but unlike that variety and others of the same season, the fruit is not here today and gone tomorrow but will keep in condition for a week to ten days. The fruit is medium sized, pyriform, very melting, with not such a strong musky flavour as 'Williams'.'

Amateurs sometimes tell me that they will not plant pears where the number in the household is small because it is impossible to consume all the fruit from a tree of, say, 'Williams'' during the short time it is in season. My answer to this is simply to bottle surplus fruit. Although fruit preserved in this way may not be the same as the fresh product, it can be very welcome when pears are out of season. Varieties which

bottle well are 'Williams',' 'Doyenné du Comice,' 'Gorham,' and a variety only mentioned briefly, 'Laxton's Superb.' A few other high quality pears are 'Thompson's,' 'Comte de Lamy,' 'Beurre Dumont' and 'Belle Guérandaise.'

So much for pears, and now for *plums*. Of all the tree fruits, the plum belongs to the private grower much more than to the commercial one. There is no doubt that, with the wealth of scientific knowledge available, modern machinery and correct storage conditions, the commercial fruit-grower can produce certain varieties of apple and pear better than the amateur can, and that may partly account for the fact that many people rather take their quality for granted. However, for one reason or another most of the high quality plums do not lend themselves to commercial work. For instance, the commercial grower would not find it practicable to leave his fruit of 'Green Gage' on the tree until the skin began to crack, but it is only then that the true flavour is found. Incidentally, the term gage, which is generally used to indicate a high quality plum, is a purely English one, having been given to the plum 'Reine Claude' when its name was lost after its introduction into this country at the beginning of the eighteenth century. Although its original name is French, the 'Green Gage' is probably a native of Greece.

If you wish to produce high-quality plums, you must provide suitable pollinating varieties. Most of the gages are self-sterile and have to be cross-pollinated before a crop can be obtained. In some seasons, even gages will overcrop and must be thinned, otherwise the flavour is insipid and not to be compared with the rich flavour of fruits from trees properly thinned. To obtain the full flavour of any gage it should be left on the tree until fully ripe. This may mean allowing the skin to crack or even shrivel, but only then is the full flavour reached. Incidentally, it is not generally known that gages can be kept for a week or ten days in store. Pick the surplus fruit when ripe but with the skin intact and dry, and leave in a shed for twenty-four hours so that any skin moisture can evaporate. Then wrap each fruit in soft paper and store in single layers in a cool, dry, airy place. And now for varieties.

'Green Gage,' or 'Reine Claude,' has already been mentioned. It is undoubtedly one of the best flavoured of all plums. The fruit is medium-small, round, greenish-yellow when fully ripe. The flesh is also greenish-yellow, tender, juicy, sugary, with a delicious flavour. It ripens about the end of August. There are a number of forms of 'Green Gage' in existence, for example 'Cambridge Gage,' but none of these, which are in all probability seedlings from 'Green Gage,' seems to equal in flavour the true variety.

The 'Transparent' family comes next in order of merit. 'Early Transparent' is not included because it can be disappointing as it is liable to crack in wet seasons, but 'Transparent Gage,' sometimes called 'Old Transparent,' should be included in any select list. The

fruit is larger than a green gage and flattened at each end. The skin is greeny-yellow and is so transparent that when the fruit is ripe the golden-yellow flesh shows through. The flesh is tender, rich and aromatic. This is undoubtedly one of the best gages and ripens just after 'Green Gage.' There is said to be a 'Late Transparent' but so far I have not been able to discover the true variety, stocks received under this name eventually proving to be the same as 'Transparent Gage.' However, there is one other member of this family that deserves far wider recognition than it has so far received, and that is 'Golden Transparent.' The fruit of this is a little larger than 'Transparent' but instead of being greeny-yellow it is a golden-yellow with bright red dots. The texture and flavour are very like 'Transparent Gage' but 'Golden Transparent' ripens considerably later, in mid September. In cold areas it would be advisable to grow it against a wall. Equal in merit to the 'Transparents,' but later in ripening, is 'Coe's Golden Drop,' whose excellent quality must be known to most lovers of fruit. There is a tendency to pick this variety too soon—it should be left on the tree until the stalk end has begun to shrivel and wrinkles appear.

Many people associate quality in plums with a greenish or golden colour and perhaps the general expression "green gage" has something to do with this idea, but it is not a correct one. The variety 'Kirke's,' which is one of the most richly flavoured plums, has a dark purplish-red skin. The flesh is greenish-yellow, juicy and of excellent quality. It is medium-large and roundish in shape and ripens at the beginning of September. Another excellent dark-skinned variety is 'Purple Gage' ('Reine Claude Violette'), which has a medium to small round fruit with greenish flesh which, when fully ripe, is very rich in sugar and has a delicious flavour. This is another variety that should be left on the tree until it begins to shrivel.

'Angelina Burdett,' 'Jefferson,' 'Bryanston Gage,' 'Laxton's Delight' and 'Blue Imperatrice' could all be added to this list but there is not time enough to describe them. However, I ought to mention a few varieties that are good for preserving, and some of the best are 'Early Laxton,' 'Early Rivers,' 'Black Prince,' 'Victoria,' 'Green Gage' and 'Shropshire Damson.'

Continuing with stone fruits, a word or two about peaches and nectarines. While early-ripening peaches appeal to some, it can be said that, like most other kinds of hardy fruit, earliness and quality rarely go hand in hand and most early peaches, e.g. 'Amsden June,' are slightly astringent and, if the season is poor, the flesh may be stringy. For quality we must wait for the mid-season to late varieties. There is little doubt that sight, as well as palate, plays a part in the enjoyment of a peach. What is more attractive in appearance than a well-ripened 'Peregrine'? The bright crimson fruit is a good size, while the firmness and fine texture of the flesh, which has an excellent flavour, make it, I think, the best English peach for outdoor culture. It ripens in mid August.

In this country there is a certain prejudice against yellow-fleshed peaches as opposed to our usual white-fleshed fruits, but there is no justification for this as certain of the yellow-fleshed varieties are of good quality. The next choice is therefore one of this type, an American variety called 'Rochester' which, in the States, is regarded as an excellent peach but a poor cropper. In my limited experience, it is a regular and prolific bearer, more so even than 'Peregrine,' and, although the flesh is not so juicy, its texture and flavour are very good. The fruits are a good size, golden yellow in colour, and the firm flesh combined with a free stone makes it suitable for bottling. It ripens just after 'Peregrine.'

The nectarine is more or less a smooth-skinned peach, but many growers will say that the nectarine is the juicier and has on the whole a richer flavour. Although I agree with this, I think the flesh of the nectarine is more fibrous than the smooth flesh of the best peaches. I shall just mention one variety, 'John Rivers,' which ripens towards the end of July. It is a free cropper and the medium-sized fruits have a bright red cheek, are very juicy and of excellent flavour.

My experience of sweet cherries is very limited and I shall therefore only mention two old and two new varieties. The old ones are 'Roundel' and 'Waterloo.' 'Roundel' is a large early July variety, dark red but not quite black, with dark red flesh, very juicy, sweet and well flavoured. 'Waterloo' is of medium size, deep crimson-red going nearly black at the end of June or early July. The flesh is very dark red, tender, with a very sugary and rich flavour. The new varieties are 'Merton Heart' and 'Merton Bigarreau.' 'Merton Heart,' ripening in early July, is a large cherry, dark crimson to black with dark crimson flesh, very sweet and rich. 'Merton Bigarreau' is a late cherry ripening about mid to late July. Its large fruits turn almost black when ripe. The flesh is light crimson, firm, juicy, very rich and of excellent flavour. So much for tree fruits.

In the world of bush fruits and strawberries our forefathers were considerably better off in the choice of high quality varieties than we are today. You have only to go through the pages of a fruit catalogue published thirty years ago to find a wide selection of strawberries, raspberries and gooseberries, but the ravages of virus diseases on stocks of strawberries and raspberries have left few if any of these varieties, while the decline in the popularity of the gooseberry has considerably reduced the number of varieties now available. Most of you will know the two strawberries I have chosen, 'Royal Sovereign' and 'Auchincruive Climax.' 'Royal Sovereign' is probably the only strawberry grown today which was known by our forefathers, and that this is so is due to the efforts of East Malling Research Station in obtaining and maintaining a virus-free clone. It is considered by many to be the best flavoured variety grown at present, and as it is so widely distributed comment on fruit characters is unnecessary. The variety 'Auchincruive Climax' was bred by MR. R. D. REID for resistance to Red Core and although only introduced in 1947 is probably more widely grown than any other variety. Its popularity is mainly due to good cropping

combined with excellent quality. The bright red fruits are of good size, firm, very juicy and of first-class flavour. It ripens after 'Royal Sovereign' and apart from being an outstanding dessert fruit is very good for preserving.

In raspberries the choice is equally limited, most if not all the high quality varieties having been lost through virus diseases. It cannot be said that any of the new varieties introduced in recent years compare in flavour with the now extinct 'Superlative,' 'Park Lane,' 'Pyne's Royal' and others. Only two varieties will be mentioned, the first being 'Lloyd George,' a variety that has been kept in existence only by the efforts of the virologists. It is the best flavoured of the present-day raspberries and its merits are known to all growers of soft fruit. The other variety, 'Norfolk Giant,' is recommended not so much for dessert as for preserving. The high acidity of the fruit results in a good quality preserve.

It is difficult to understand why the gooseberry is so sadly neglected nowadays. It is easy to grow, crops regularly, and the best flavoured varieties are comparable in quality with any other fruit of the same season. Let it be noted, however, that there is as much difference in quality between varieties of gooseberry as between, say, a 'Worcester Pearmain' and a 'Cox's Orange Pippin.' Furthermore, size and quality do not always go together. Gooseberries can be green, yellow, white or red but the green and yellow varieties seem to be the best flavoured. 'Glenton Green' is one of the best greens. The medium-sized fruit has pale green skin, almost transparent when fully ripe, and has a delicious flavour. 'Langley Gage,' another green variety, has a medium-sized roundish fruit, pale yellow-green when fully ripe, nearly transparent, with a very fine flavour. For an early-ripening yellow variety it would be difficult to better 'Early Sulphur.' Its pale golden-yellow fruits with flesh of the same colour have an excellent flavour. 'Cousen's Seedling' is probably the best late-ripening yellow. This variety has moderately large bright clear yellow fruits with a very good flavour, and it is not so suceptible to American Gooseberry Mildew as some of the varieties already mentioned.

The red varieties have on the whole larger fruits than the others and one of the best of them is 'Whinham's Industry.' The medium-large berries are dark red when fully ripe, with a sweet flavour; the variety is rather susceptible to American Gooseberry Mildew. An old variety with a smaller fruit than the average red is 'Red Champagne.' The fruit is light red and has a thick skin. Its flavour is rich and could almost be described as aromatic.

There is no really white gooseberry, the colour of the type being pale milky- or greyish-white. One of the best is 'Mitre,' with large round fruits, which, when fully ripe, are very sweet and rich. Last comes 'Whitesmith,' whose colour is really nearer to green than white, but The Royal Horticultural Society places this variety in the white group. It is one of the best all-round gooseberries, combining vigour, flavour

and cropping capacity. The berries are moderately large, oval, pale green and when fully ripe have a first-class flavour.

In a comparatively short talk like this, it is impossible to deal adequately with all the varieties I would like to mention, particularly when all kinds of hardy fruit have to be included. One lecture would not really be too long to talk about the better varieties of one kind alone. Therefore no apology is made for omissions. Quite a number of the varieties dealt with must be well known to the amateur fruit-grower who may have thought that in a lecture of this kind lesser known varieties would have been considered. However, as I said at the beginning, quite a large number of our better quality varieties are now available to the general public and are therefore well known, but I hope that this talk may have stimulated interest in fruits chosen for flavour rather than for looks or ease of growing and marketing.

A ROCK GARDEN AT GARDONE RIVIERA IN ITALY

Dr. A. Hruska

WITH AN INTRODUCTION BY MR. W. E. TH. INGWERSEN

(*Lecture given on June* 15, 1954; MR. G. L. PILKINGTON *in the Chair*)

MR. INGWERSEN: MR. PILKINGTON has introduced our lecturer to you and he has asked me to tell you something about the remarkable garden DR. HRUSKA has created for himself under unusually difficult conditions.

Who would have thought to find a rock garden, and a good one, in the sub-tropical conditions on the north bank of Lake Garda?

I will tell you how it came about that my wife and I visited Villa Hruska and its kindly owner. We were spending a few weeks in the Upper Engadine in Switzerland when one fine morning whilst we were eating our breakfast on the terrace of our hotel in full view of the snow and icefield of the Pitz Bernina a Swiss friend said, "How would you like to visit Italy today and see the lakes of Como and Garda?" We said that we would like it very much and soon we were driving along the lovely chain of lakes, from which flows the River Inn, towards Maloja and down the endless loops of the Maloja Pass, which in an hour or two brought us to the shore of Lake Como. We thought it a pretty good effort to enjoy a latish breakfast among the everlasting snows and indulge in an early lunch beneath oleanders, pomegranates, bignonias, mimosas, etc., in the warmth of Lake Como which glinted below a heat haze.

Early afternoon found us at Gardone Riviera just above the deep peacock-blue waters of Garda, and across the great lake Monte Baldo arose in all its impressive bulk. Soon we drew up by a high wall and, ascending a steep flight of steps, found ourselves in a richly tropical garden. Here were cannas, in all their splendid glories, hedychiums

scenting the hot air, tall cypresses, eucalypti, dracaena, trachycarpus and phoenix palms 30 and more feet high, and Fortune's Rose and other climbers dangling their flowering trails from all this tropical greenery. Here, too, were bold plantings of tall *Musa basjoo* and mighty groves of green-stemmed *Bambusa mitis* towering 40 feet into the air and their culms were 3 to 4 inches in diameter (Fig. 47).

The atmosphere was humid and there was the tinkle of running water everywhere; shallow rills splashed the shingly pathways and in the midst of bamboo thickets was a quiet pool crossed by a frail swinging footbridge. Emerging from these bamboo thickets we could hardly trust our eyes for here was a veritable high alpine valley with pines and northern trees and in the distance the glowing pinnacles of the Dolomites. Here was Serapis, the Five Towers, Monte Cristallo and all the fantastic crumbling glory of the dolomitic limestone. No, it was not possible, it could not be the Dolomites, the whole bulk of the Alps of Judicaria intervened between us and the Tyrol. Here was something created by man, but what a perfect picture; surely it took a great artist to call to life this wonderful deception. Here, at our feet and all around us was the alpine flora in rudest health and in perfect happiness. It needed but the distant bells of grazing cattle to complete this illusion, the whistle of the marmot and the musical call of the alpine chough.

We stood long and marvelled and I, who had railed at an imitation Matterhorn in the Thames Valley at home, was taking my hat off to the designer of this perfect picture.

Later that night we sat and drank coffee with DR. HRUSKA and his family and after that he threw on to a screen a great many coloured slides he had made of his garden, and greatly daring I asked DR. HRUSKA if he would come and show these slides to the Fellows of our Society and he agreed and here he is. I will leave him to tell you all about this unique and wonderful garden of his.

DR. HRUSKA: About forty-eight years ago I came to Gardone Riviera, at the beautiful Lake of Garda. Garda is the most luminous and many-coloured lake that I have ever seen. I was so deeply attracted by its beauty that I bought some land and there I began to plan a garden.

The land was on the slopes of Monte Lavino and was about 10,000 square metres in size. Up to then I had had no practical experience in gardening. I also lacked the good taste which one acquires only after seeing many beautiful gardens. Thus I began to create the plans for my garden like the complete beginner that I was.

As a great lover of nature, particularly mountains, I wanted to have around my house surroundings which reproduced as closely as possible alpine scenery with rocks and mountain streams amongst which rock and alpine plants could be grown successfully.

I immediately found myself confronted with the difficulties of the climate and the geology of the district. One has to take into account that the Lake of Garda is over 200 feet above sea-level, that the climate is very hot and the vegetation subtropical. The atmosphere is extremely

dry because the "Ora" wind carries all the humidity to the north. Thus the first thing I had to do was to obtain and keep a constant humidity in the garden. Besides, the ground necessary for mountain plants had to be rocky. I read and studied all the books about gardens; Japanese, Chinese, English, German and also those written in the Middle Ages. Finally, I read Foerster's *Study of Rock Gardens*.

I began to make a rock garden although I was completely ignorant of geology and plant associations. I had no knowledge of the composition of my soil and still less of symbiosis. Because of this I committed many errors and many plants died. I changed the position of my plants again and again and by careful observation of other rock gardens and much study I finally achieved success.

I built in the centre of the garden a solid rocky massif not only to give the illusion of alpine scenery but to gain height and natural positions for the plants. It was constructed to imitate the towering peaks of the Tyrol and finally reached a height of over 30 feet. I used rock from the Dolomites and linked these into a solid mass by the use of cement coloured with oxide of iron so that the joints were not visible. It was necessary to make many tests with odd pieces of stone until I found the correct colour. It was also necessary to make sure that the tilt of the strata was closely followed and to avoid the random mixture of horizontal and vertical seams. If this had not been done an unnatural jumble would have resulted.

When one is concerned with a small rock garden, it is not necessary to devote so much attention to the general design. When, however, the rock garden is a really extensive one, one must have a more precise conception. I have tried to obtain the greatest possible variety of scenery in my garden by placing pools, rocks and groups of conifers and rhododendrons here and there so that every few yards the view becomes quite different. A garden, notwithstanding the variety of the plants, may become monotonous and boring. This often happens even in Rome where plants of all sorts may be seen. I am amazed that even at the present time people are still concerned with making geometrical gardens where the natural shapes of the trees and plants are distorted, especially conifers which are trimmed and whose trunks are denuded of their branches.

All over Italy, except at the Lago di Garda, cypress trees look like enormous paint brushes. Any cutting and clipping of trees destroys the natural beauty and spontaneous phantasy and romanticism of Nature and should be avoided. In my own garden I have avoided all straight lines, flat surfaces and pleached avenues of trees and hedges.

Tall trees like laurels (*Laurus nobilis*) and many different conifers were placed and planted to conceal the neighbouring houses. Now my garden looks like part and parcel of the nearby mountain (Figs. 48 and 49).

Perhaps it would be advisable at this point to give some advice to those who wish to construct their own rock garden but who live far from mountains and therefore find it difficult to obtain rocks. Gravel

and sand is obtainable anywhere and to make artificial rocks I take one part of cement to two parts of gravel and two parts of sand. This should be mixed with the oxide of iron necessary to give the reddish colour seen at the Côte d'Azure, for instance. This mixture should then be placed into moulds of wood which can be opened and removed when the mixture is setting and these cast blocks are allowed to dry. These artificial blocks can then be trimmed along their edges and corners until they appear similar to natural rocks. The blocks can then be built on the lines of natural stratified rock with the cleavage lines running all in the right direction and if the appearance of great age is desired further colours may be used in streaks and patches to stimulate growing mosses and lichens.

If there is a natural supply of water available or piped water, little tarns and ponds can be constructed in which submerged and floating plants can find a home.

To complete the rock garden I planted some heathers. On one side the upright *Erica arborea* and on the other side the carpeting *E. carnea*.

At the foot of the base of the rock garden I constructed several little lakes connected by as many little streams. This was a very difficult job. My water supply comes by means of a large pipe all the way from a spring on the mountain behind my house. Another pipe connects all the little lakes, and during the hottest summer weather I allow all these lakes to overflow into the alleys and pathways during the night; my soil is very porous and the water is easily absorbed.

As regards the watering of the plants I made many mistakes. I allowed my gardeners to use too powerful a jet which resulted in the washing away of the earth from newly planted subjects with dire results. A visitor pointed out to me this danger and now I use a vaporizer with far happier results. My water supply filtered through very limy soil so that the water became unsuitable for many of my plants. To obviate this, I built a settling tank or reservoir in the highest part of my ground. All the water flows through this and much of the lime is precipitated. Especially susceptible plants are watered at least three times a year with a solution of phosphate of bi-ammonia and sulphate of iron.

Since my climate is very hot and dry all my large rock complexes are provided with a core of tufa covered with my reddish artificial stone. Rifts and apertures are left so that the roots of the plants can reach this moisture-storing centre. No water-holding holes and crevices are left in my construction; all have outlets to drain off surplus water and we see to it now that no soil is washed away exposing the roots of the plants. The advantage of tufa is that the plant roots can penetrate into the porous stone and there find coolness and humidity. We realize that plants love all the moving water they can get and that stagnant moisture spells danger.

Many visitors are amazed to see so many high alpine plants flourishing in my garden in spite of the great prevailing heat of our district.

For example, such plants as ramondas, *Primula auricula* and *P. spectabile*. If care is taken to supply the essentials necessary for plant life, plants can be made to thrive as one wishes, as for example junipers, spruces and small pine trees, etc.

Further there is the consideration of exposure to fierce sunlight. It is of the greatest importance that exposure to sun should be balanced by sufficient humidity. If the surroundings of the plants can be kept sufficiently moist they will withstand and enjoy full exposure to the glare of a southern sun.

Generally speaking the composition of the soil is not given sufficient consideration. Not enough importance is attached even in good books on gardening to the composition of the soil. In my experience more plants succeed in neutral or slightly acid soils than in strongly alkaline earth. There is a limited number of plants which have adapted themselves to alkaline soils but they are only a small minority. For example, plants which appear to be lime-loving in nature can be very well cultivated in a good soil mixture containing no lime.

For a time I could never succeed in growing either *Primula hirsuta* or *P. glutinosa* in my garden but since I have mixed leaf mould and rhododendron peat with my soil I have finally succeeded in cultivating these most desirable plants.

PLANTS AND PROBLEMS—XVI

PLANTS FOR A SHADY BORDER

Question. In our garden there is a long, narrow piece of ground where we would like to grow a bright selection of flowers. Unfortunately the soil is heavy and tends to be wet and, what is more, it is shaded by buildings for a good part of the day. Can you suggest what we might grow in such a position?

Answer. A good display of colour can be obtained in shady positions of this sort with a selected list of herbaceous plants. Such a list might include:

Aconitum napellus
Anemone hybrida varieties
Aquilegia varieties
Aruncus sylvester (syn. *Spiraea aruncus*)
Brunnera macrophylla (syn. *Anchusa myosotidiflora*)
Campanula glomerata
Campanula persicifolia
Dicentra spectabilis
Doronicum austriacum
Phlox paniculata varieties
Tradescantia virginiana varieties.

In conjunction with these herbaceous plants you could also include *Convallaria majalis*, the lily-of-the-valley, *Corydalis cheilanthifolia*,

Helleborus niger the Christmas rose, and *Pulmonaria angustifolia* varieties.

Before planting a shady site with herbaceous plants it is advisable first to enrich the soil with generous applications of any sort of organic matter like garden compost or animal manure. In dealing with heavy, clay soils, the surface drainage should be improved and this can be done by raking into the surface dressings of gravel or coarse ashes.

DE-BLOSSOMING NEWLY PLANTED FRUIT TREES

Question. Some newly planted apple and pear trees in my garden are flowering well. Will it be safe to let them bear fruit or not?

Answer. It is never advisable to allow trees to carry more than a few fruits the first season after planting. Everything should be aimed at encouraging root-action and growth, and only when the trees have become well-established in their new site should they be allowed to crop freely. Your best course this year will be to de-blossom the trees just as the flowers are about to open. This can be done either by using a pair of scissors or with the finger and thumb, taking care to remove the flowers only and not the basal rosette of leaves. Removal of the latter naturally reduces the leaf area and has a weakening effect on the tree. The odd cluster of flowers can be left if desired but certainly no more than half a dozen fruits should be allowed to form on 3–4-year-old trees. Even these should be removed at an early stage if it is thought that a particular tree is backward in growth.

STRAWBERRIES—REDUCING FROST DAMAGE

Question. Strawberries do well in my garden but in most years the potential crop is reduced considerably by frosts during the flowering period. Unfortunately the garden is in a frosty hollow and there is no chance of moving my strawberry bed to higher ground. Is there anything I can do that will at least reduce the risk of frost damage?

Answer. A mistake commonly made by strawberry growers—one which tends to increase frost damage—is to straw down too early. This prevents a free flow of warm air from the soil and so results in colder temperatures around the plants at ground level on frosty nights. Strawing-down should be delayed until most of the flowers have set, by which time the chances of having a damaging frost are much reduced. When frost is anticipated considerable protection can be afforded by spreading a light layer of straw *over* the plants, but this *must* be removed during the day-time.

GOOSEBERRY AND CURRANT LEAF SPOT

Question. What are the small black spots which come on the leaves of my gooseberries and, I believe, cause them to drop earlier?

Answer. You are probably referring to the leaf spot caused by the fungus parasite *Pseudopeziza ribis* which appears in early summer. It shows as very small dark brown or blackish spots, irregular in shape and

scattered anywhere over the leaf surface. When these spots are very numerous the leaf yellows and falls. This early defoliation has a weakening effect on the bushes although we believe the attack in the first place is encouraged because the bushes have lost vigour through neglect, drought, etc. The disease will attack red and black currants as well as gooseberries. It can be checked by spraying with colloidal copper according to makers' instructions, and this can be done on young nursery bushes in May and at any time during summer, but on fruiting bushes should be applied when the fruit is set and again only when the fruit has been picked. During winter the old leaves should be well buried and every step such as feeding and mulching (where desirable) should be taken to keep the bushes vigorous.

RASPBERRY SPUR BLIGHT

Question. Is Spur Blight a serious disease of raspberries? I think it is appearing in my canes.

Answer. We would not call Spur Blight (*Didymella applanata*) on raspberries a serious disease, but it can be troublesome on occasion. The first infections are on the young canes and show as purplish blotches near the bases of the leaves. These patches gradually fade and by the spring on the fruiting canes show as pale grey, almost white, areas, generally situated near the buds (i.e. at the nodes). At such places the buds are either killed or so weakened that should they grow out the shoot soon withers and dies back. On any one cane the number of affected buds may vary from one to several. The young growths are infected by spores released from the old canes above them and infection is favoured by a wet season or by overcrowding in the young canes. To control the disease it should be sufficient to cut out badly infected old canes and to thin the young ones early so as to allow good air circulation among them. As an additional precaution spraying with colloidal copper on the young growths from an early stage may be done.

PEAR LEAF BLISTER MITE

Question. I have an old pear tree on a south wall which has recently been severely pruned back. It is now throwing out a few shoots but all the leaves are marked similar to the enclosed. Is there any spray which will check this condition?

Answer. The yellowish-red blisters on the upper surface of the pear leaves have been caused by the Pear Leaf Blister Mite, *Phytoptus piri*. Later the blisters turn brown and finally black.

The microscopic mites overwinter beneath the scales of the buds. At bud burst they enter the tissue of the young leaves causing the blisters to appear. The mites continue to live and reproduce in the blisters until the autumn when they return to overwinter beneath the bud scales. Several overlapping generations occur each year.

It is not possible to control this pest effectively at this time of the

year since the mites are well protected in leaf tissue. However, the pest is easily controlled by an application of 5 per cent. lime sulphur at the end of March, providing the spray is applied carefully making sure that all the buds are well wetted.

LILY VIRUS

Question. What are the signs of virus disease in lilies and what is the control?

Answer. The common virus disease of lilies in this country is considered to be due to infection by Cucumis Virus 1 which is spread by aphids. The symptoms show as a mottling effect seen on the leaves as alternate light and dark green areas and the leaves may or may not be distorted or curled. In varieties such as *Lilium superbum* and *L. speciosum* the marking takes the form of scattered light green or yellowish stripes running down the leaf. The virus affects some lilies more than others for some are not much affected, others gradually deteriorate over a number of years, while some kinds are very soon crippled and die. It is best to try to keep clean stocks by careful "rogueing" (i.e. destroying obviously affected plants) and preventing infestation by aphids. As the virus is not seedborne it is possible to raise a clean stock from seed but the seedlings should not be grown near any possibly infected stocks. Propagation should, of course, only be done from plants known to be absolutely healthy, for as in all virus diseases, the infection extends to every part of the plant including the bulb scales.

HOLLY LEAFMINER

Question. I should be very glad if you could give me a diagnosis of the pest or disease present in the enclosed holly leaves. If there is any remedy for the condition, I should be much obliged to receive details.

Answer. The large brown blisters on the holly leaves have been caused by the Holly Leafminer, *Phytomyza ilicis*. The small, black, adult flies are on the wing in late May and early June and the females lay their eggs singly on the underside of the leaves near the midrib. On hatching, the young larvae first burrow into the midrib but later enter the lamina of the leaf causing the blister-like mine to develop. Feeding continues within the mine until the following March or April when the fully fed larvae pupate. The puparium or chrysalis may be seen at this time of year partly protruding from the mine. The adults appear a few weeks later.

Small infestations on specimen trees may be reduced by hand-picking. The usual method of control is to spray with a nicotine soap wash during the summer making sure that the underside of the leaves are well wetted with the spray. We consider that DDT applied about mid May, followed by a further application three weeks later, should give satisfactory control by killing the adults before egg-laying commences.

WISLEY TRIALS, 1954

GLADIOLUS

One hundred and eighty-eight stocks of gladiolus were grown at Wisley in the trials during 1954. Twelve corms of each stock were planted on April 9, 1954. On the recommendation of a sub-committee of the Floral Committee A which inspected the trial on July 26 and August 4 and 16, 1954, the Council of The Royal Horticultural Society has made the following awards.

The number in brackets after the description of the variety was that under which it was grown in the trial.

Flowers White and of Cream shades

ANDES. (Raised, introduced and sent by Messrs. P. Visser Cz., St. Pancras, Holland.) **H.C.** August 16, 1954.—60 inches tall, eighteen flowers per spike with five open at once. Flowers 4¾ inches diameter, pure white with slight purple marking at base of throat. [5]

GRAND ILLUSION. (Raised, introduced and sent by Messrs. Blom & Padding, Beverwijk, Holland.) **H.C.** August 16, 1954.—57 inches tall; twenty flowers per spike with five open at once. Flowers 6 inches diameter, white with a streak at throat of Dianthus Purple (H.C.C. 730), young flowers faintly tinged a very pale shade of Dianthus Purple (H.C.C. 730/3). [14]

Flowers of Yellow shades

CYCLUS. (Raised, introduced and sent by Messrs. N. V. Konynenburg & Mark, Noordwyk, Holland.) **H.C.** August 16, 1954.—48 inches tall; eighteen flowers per spike with five open at once. Flowers 4½ inches diameter, Mimosa Yellow (H.C.C. 602/1). [24]

FULDA. (Raised, introduced and sent by Messrs. N. V. Konynenburg & Mark.) **H.C.** August 16, 1954.—48 inches tall; twenty-one flowers per spike with eight open at once. Flowers 4¼ inches diameter, Mimosa Yellow (H.C.C. 602/3). [38]

Flowers of Orange shades

ARANJUEZ. (Raised, introduced and sent by Messrs. N. V. Konynenburg & Mark.) **F.C.C.** August 16, 1954.—Described R.H.S. JOURNAL **75**, p. 32 (**H.C.** 1949, **A.M.** 1952). [51]

Flowers of Pink shades

CHRONIQUE. (Raised, introduced and sent by Messrs. N. V. Konynenburg & Mark.) **A.M.** August 16, 1954.—Described R.H.S. JOURNAL **78**, p. 35 (**H.C.** 1952). [96]

ENTICEMENT. (Raised, introduced and sent by Messrs. P. Visser Cz.) **A.M.** August 16, 1954.—54 inches tall; nineteen flowers per spike with seven open at once. Flowers 4¼ inches diameter, a delicate shade of Phlox Pink (H.C.C. 625/3) with a blotch at throat of cream. [137]

TOLEDO. (Raised, introduced and sent by Messrs. P. Visser Cz.) **A.M.** August 16, 1954.—Described R.H.S. JOURNAL **79**, p. 99 (**H.C.** 1953). [138]

TRÈS JOLIE. (Raised, introduced and sent by Messrs. Blom & Padding.) **A.M.** August 16, 1954.—Described R.H.S. JOURNAL **78**, p. 35 (**H.C.** 1952). [62]

GEORGE MONRO. (Raised, introduced and sent by Messrs. N. V. Konynenburg & Mark.) **H.C.** August 16, 1954.—54 inches tall; twenty-one

flowers per spike with six open at once. Flowers 4 inches diameter, Shrimp Red (H.C.C. 616/1) splashed Porcelain Rose (H.C.C. 620) with a blotch at throat of Geranium Lake (H.C.C. 20). [60]

HANEZORE PFITZER. (Raised by Messrs. Wilh. Pfitzer, introduced and sent by Messrs. N. V. Konynenburg & Mark.) **H.C.** August 16, 1954.—60 inches tall; twenty-one flowers per spike with eight open at once. Flowers 4½ inches diameter, Shell Pink (H.C.C. 516/3), outer petals marked Porcelain Rose (H.C.C. between 620/1 and 620), inner petals with blotch at throat of Barium Yellow (H.C.C. 503/3). [58]

JENNY LIND. (Raised, introduced and sent by Messrs. Blom & Padding). **H.C.** August 16, 1954.—60 inches tall; eighteen flowers per spike with six open at once. Flowers 4½ inches diameter, a delicate shade of Porcelain Rose (H.C.C. between 620/2 and 620/1). [114]

Flowers of Red shades

BROADWAY MELODY. (Raised, introduced and sent by Messrs. N. V. Konynenburg & Mark.) **F.C.C.** August 16, 1954.—Described R.H.S. JOURNAL 78, p. 36 (**A.M.** 1952). [97]

BIARRITZ. (Raised, introduced and sent by Messrs. Blom & Padding.) **A.M.** August 16, 1954.—Described R.H.S. JOURNAL 75, p. 34 (**H.C.** 1949). [89]

RED FASCINATION. (Raised, introduced and sent by Messrs. P. Visser Cz.) **A.M.** August 4, 1954.—Described R.H.S. JOURNAL 79, p. 100 (**H.C.** 1953). [80]

CARMEN. (Raised, introduced and sent by Messrs. N. V. Konynenburg & Mark.) **H.C.** August 4, 1954.—57 inches tall; twenty-one flowers per spike with six open at once. Flowers 5 inches diameter, a vivid red near Signal Red (H.C.C. 719) with a small streak at throat of cream. [100]

NEGUS. (Raised by Messrs. H. J. Salman & Sons, introduced and sent by Messrs. P. de Jager & Sons, Heiloo, Haarlem, Holland.) **H.C.** August 16, 1954.—54 inches tall; nineteen flowers per spike with eight open at once. Flowers 4½ inches diameter, a velvety shade of Cardinal Red (H.C.C. 822) splashed black. [132]

NEW YORK. (Raised by Messrs. H. J. Salman & Sons, introduced and sent by Messrs. P. de Jager & Sons.) **H.C.** August 16, 1954.—54 inches tall; eighteen flowers per spike with eight open at once. Flowers 4½ inches diameter, Rose Red (H.C.C. 724/1) changing towards margins of petals to Cardinal Red (H.C.C. 822/1) with a blotch at throat of very deep red. [135]

RED PEPPER. (Raised, introduced and sent by Messrs. N. V. Konynenburg & Mark.) **H.C.** August 16, 1954.—51 inches tall; seventeen flowers per spike with seven open at once. Flowers 5½ inches diameter, a vivid red near Dutch Vermilion (H.C.C. 717/1). [106]

VOLCANO. (Raised, introduced and sent by Messrs. P. Visser Cz.) **H.C.** August 16, 1954.—54 inches tall; nineteen flowers per spike with six open at once. Flowers 4½ inches diameter, a vivid red near Dutch Vermilion (H.C.C. 717/2). [74]

Flowers of Mauve and Purple shades

KEUKENHOF. (Raised, introduced and sent by Messrs. P. Visser Cz.) **A.M.** August 16, 1954.—60 inches tall; eighteen flowers per spike with eight open at once. Flowers 5 inches diameter, inner petals Fuchsia Purple (H.C.C. between 28/3 and 28/2) with a streak at throat of cream, outer petals Fuchsia Purple (H.C.C. 28/3) overlaid with Spinel Pink (H.C.C. 0625/1). [139]

ALEXANDER DUMAS. (Raised, introduced and sent by Messrs. N.V. Konynenburg & Mark.) **H.C.** August 16, 1954.—54 inches tall; twenty flowers per spike with seven open at once. Flowers 3¾ inches diameter, Mauve (H.C.C. 633/2) with a blotch at throat of cream. [163]

Flowers of Blue-violet shades

BLUE SKY. (Raised, introduced and sent by Messrs. Blom & Padding.) **H.C.** August 5, 1954.—54 inches tall; eighteen flowers per spike with seven open at once. Flowers 5½ inches diameter, white ground heavily splashed and tinged Dauphine Violet (H.C.C. 039/2) with a blotch at throat of Dauphine Violet (H.C.C. 039/1) the blotch streaked with cream. [175]

GUSTAV MAHLER. (Raised, introduced and sent by Messrs. N. V. Konynenburg & Mark.) **H.C.** July 26, 1954.—48 inches tall; twenty flowers per spike with six open at once. Flowers 3¼ inches diameter, Amethyst Violet (H.C.C. 35/2) splashed Amethyst Violet (H.C.C. 35/1) with a blotch at throat of Plum Purple (H.C.C. 934/3) the blotch streaked with creamy-white. [166].

WINTER LETTUCE

Twenty-six stocks of lettuce were received in 1953 for trial at Wisley. In addition stocks of Lettuce A.1, Arctic King, Imperial, Spring Beauty, White Heart and Winter White were included to act as control varieties. The trial was sown on September 8, 1953, and planted in the open ground on October 23, 1953. The rows were spaced one foot apart and the plants were one foot apart in the rows. The trial was inspected on May 11, 1954, by a sub-committee of the Fruit & Vegetable Committee and on its recommendation the Council of The Royal Horticultural Society has made the following awards.

The number in brackets after the description of the stock was that under which it was grown in the trial.

ACE OF HEARTS. (Raised, introduced and sent by Messrs. Elsoms (Spalding) Ltd., Elsom House, Spalding, Lincolnshire.) **H.C.** May 11, 1954. Cabbage type. Plant 8 inches high, 10 inches across, compact, upright; leaves light to medium green, blistered and crumpled; heads firm, of good quality, maturing evenly. [6]

CLUSEED WINTER CROP. (Raised by Messrs. L. Clause, S.A., Brétigny-sur-Orge (S. et O.) France, introduced and sent by Messrs. J. L. Clucas, Ltd., Ormskirk, Lancashire.) **H.C.** May 11, 1954. Cabbage type. Plant 7 inches high, 10 inches across, compact, upright; leaves light green, blistered and crumpled; heads firm, of good quality, maturing very evenly. [19]

IMPROVED WINTER. (Raised, introduced and sent by Messrs. W. Deal & Sons Ltd., Kelvedon, Essex.) **H.C.** May 11, 1954. Cabbage type. Plant 6 inches high, 10 inches across, compact, upright; leaves light green, slightly blistered and crumpled; heads firm, of good quality, maturing evenly. [7]

WINTER CROP. (Raised, introduced and sent by Messrs.Ferry-Morse Seed Co., P.O. Box 967, Mountain View, California, U.S.A.) **H.C.** May 11, 1954. Cabbage type. Plant 6½ inches high, 10 inches across, compact, upright; leaves light green, blistered and crumpled; heads firm, of good quality, maturing very evenly. [18]

WINTER HERCULE. (Raised, introduced and sent by Messrs. L. Clause, S.A.) **H.C.** May 11, 1954. Cabbage type. Plant 5½ inches high, 10 inches across, compact, upright; leaves light green, slightly blistered and crumpled; heads firm, of good quality, maturing evenly. [25]

WINTER MARVEL. (Raised, introduced and sent by Messrs. L. Clause, S.A.) **H.C.** May 11, 1954. Cabbage type. Plant 5¾ inches high, 10 inches across, compact, upright; leaves light green, slightly blistered and crumpled; heads firm, of good quality, maturing very evenly. [16]

PLANTS TO WHICH AWARDS HAVE BEEN MADE IN 1954

The Royal Horticultural Society and the National Chrysanthemum Society have made jointly the following awards to chrysanthemums after exhibition at the Shows of The Royal Horticultural Society and the National Chrysanthemum Society on the recommendation of the Joint Chrysanthemum Committee.

EARLY-FLOWERING CHRYSANTHEMUMS

Chrysanthemum 'Annie Mathews' A.M. September 14, 1954 as a variety for show purposes. Section XXII, Incurving, medium flowered, white. Flowers 6¼ inches diameter; florets long, broad, channelled, pure white. Shown by Messrs. J. & T. Johnson, The Nurseries, Tibshelf, Derbyshire.

Chrysanthemum 'Ashover Atom' A.M. October 5, 1954 as a variety for show purposes. Section XX, Incurved, large flowered, red. Flowers 5½ inches diameter; florets medium length, broad, channelled, deep velvety crimson, reverse very conspicuous, light reddish-bronze. Shown by Messrs. Riley, Alfreton Nurseries, Woolley Moor, Derbyshire.

Chrysanthemum 'Ashover Supreme' A.M. September 14, 1954 as a variety for show purposes. Section XX, Incurved, medium flowered, yellow. Flowers 5½ inches diameter; florets short, medium width, channelled, Canary Yellow (H.C.C. 2), reverse paler yellow. Shown by Messrs. Riley.

Chrysanthemum 'Barbara Couper' A.M. October 5, 1954 as a variety for show purposes. Section XXII, Incurving, large flowered, yellow. Flowers 6¾ inches diameter; florets long, broad, channelled, Aureolin (H.C.C. 3), reverse slightly paler yellow. Shown by Messrs. H. Shoesmith Ltd., Mayford Nurseries, Moor Lane, Westfield, Woking, Surrey.

Chrysanthemum 'Ben Lomond' A.M. October 5, 1954 as a variety for show purposes. Section XXII, Incurving, large flowered, white. Flowers 6½ inches diameter; florets long, broad, channelled, outer florets pure white, inner florets greenish-cream. Shown by Messrs. Percy Lamb & Son, Marehay, Ripley, Derbyshire.

Chrysanthemum 'Catena' A.M. October 5, 1954 as a variety for show purposes. Section XXV, Anemone-centred, bronze. Flowers

4 inches diameter; outer florets 1½ inch long, short, broad, flat, inner florets tubular, tightly packed, rich chestnut bronze, reverse golden yellow. Shown by Messrs. Napier's Stepswater Nurseries Ltd., Taunton, Somerset.

Chrysanthemum 'Covent Garden' F.C.C. September 14, 1954 as a variety for show purposes. Section XXI, Reflexed, medium flowered, light bronze. Described R.H.S. JOURNAL 78, p. 140 (**A.M.** 1952). Shown by Messrs. H. Woolman Ltd., Shirley, Birmingham.

Chrysanthemum 'Equator' A.M. September 14, 1954 as a variety for show purposes. Section XXI, Reflexed, large flowered, light bronze. Flowers 5¾ inches diameter; florets long, narrow, quilled, pale chestnut bronze. Shown by Messrs. Riley.

Chrysanthemum 'Fairylight' A.M. September 22, 1954 as a variety for show purposes. Section XXI, Reflexed, medium flowered, pink. Flowers 5½ inches diameter; florets, medium length, medium width, curled, Rose Madder (H.C.C. between 23/2 and 23/1) fading slightly towards tips of the florets. reverse golden yellow. Shown by Messrs. J. & T. Johnson.

Chrysanthemum 'Francis Shapland' A.M. September 14, 1954 as a variety for show purposes. Section XXII, Incurving, large flowered, red. Flowers 6½ inches diameter; florets long, very broad, flat to slightly channelled, deep bright crimson, reverse yellow. Shown by Messrs. H. Shoesmith Ltd.

Chrysanthemum 'Gervase Riley' A.M. September 14, 1954 as a variety for show purposes. Section XXI, Reflexed, large flowered, white. Flowers 4½ inches diameter; florets long, narrow, flat to slightly quilled, outer florets white, inner florets cream. Shown by Messrs. Riley.

Chrysanthemum 'Gladys Hughes' A.M. September 14, 1954 as a variety for show purposes. Section XXII, Incurving, large flowered, white. Flowers 6½ inches diameter; florets broad, channelled, outer florets cream, inner florets deep cream. Shown by Mr. H. V. Cartwright, New Dove House Nursery, Hatch End, Middlesex.

Chrysanthemum 'Golden Empire' A.M. September 22, 1954 as a variety for show purposes. Section XX, Incurved, large flowered, yellow. Flowers 5½ inches diameter; florets medium length, broad, curled, Lemon Yellow (H.C.C. 4/1), reverse slightly paler yellow. Shown by Mr. W. B. Jackson, The Nurseries, Waverton, Cheshire.

Chrysanthemum 'High Noon' A.M. October 5, 1954 as a variety for show purposes. Section XXI, Reflexed, large flowered, light bronze. Flowers 7 inches diameter; florets long, medium width, quilled, near Spanish Orange (H.C.C. 010), reverse pale golden yellow. Shown by Messrs. H. Shoesmith Ltd.

Chrysanthemum 'Imperator' A.M. October 5, 1954 as a variety for show purposes. Section XXII, Incurving, large flowered, red. Flowers 7½ inches diameter; florets very long, very broad, channelled, deep chestnut crimson, reverse pale golden yellow. Shown by Messrs. H. Shoesmith Ltd.

Chrysanthemum 'Incurving Polar Beauty' A.M. October 5, 1954 as a variety for show purposes. Section XXII, Incurving, large flowered, white. Flowers 6 inches diameter; florets medium length, broad, channelled, tips notched, outer florets creamy white, inner florets white. Shown by J. Wallace Esq., 98 Summers Lane, Finchley, N. 12.

Chrysanthemum 'Jim Riley' A.M. September 22, 1954 as a variety for show purposes. Section XXI, Reflexed, large flowered, light bronze. Flowers 6¾ inches diameter; florets long, broad, curled, Lemon Yellow (H.C.C. 4/1) with flush of orange. Shown by Messrs. Riley.

Chrysanthemum 'Lynette' A.M. October 5, 1954 as a variety for show purposes. Section XXI, Reflexed, large flowered, pink. Flowers 6¼ inches diameter; florets long, medium width, quilled, outer florets near Rhodamine Purple (H.C.C. 29/2), inner florets near Rhodamine Purple (H.C.C. 29/2) flushed China Rose (H.C.C. 024/1), reverse creamy yellow. Shown by Messrs. J. & T. Johnson.

Chrysanthemum 'Mayford Titan' A.M. October 5, 1954 as a variety for show purposes. Section XX, Incurved, large flowered, light bronze. Flowers 6½ inches diameter; florets long, medium width, channelled, light bronze, reverse Straw Yellow (H.C.C. between 604/1 and 604). Shown by Messrs. H. Shoesmith Ltd.

Chrysanthemum 'Olive Riley' A.M. October 5, 1954 as a variety for show purposes. Section XXI, Reflexed, large flowered, pale pink. Flowers 8¾ inches diameter; florets very long, very broad, channelled, outer florets Amaranth Rose (H.C.C. 530/2), inner florets slightly paler than outer florets. Shown by Messrs. Riley.

Chrysanthemum 'Oriental' A.M. October 5, 1954 as a variety for show purposes. Section XXI, Reflexed, large flowered, light bronze. Flowers 6¾ inches diameter; florets long, medium width, tightly quilled, twisted, Buttercup Yellow (H.C.C. 4/1) tinged with orange, reverse slightly paler. Shown by Messrs. H. Woolman Ltd.

Chrysanthemum 'Pink Dawn' A.M. August 24, 1954 as a variety for show purposes. Section XXI, Reflexed, medium flowered, pink. Flowers 5½ inches diameter; florets long, broad, flat to slightly quilled, cream heavily flushed Solferino Purple (H.C.C. 26/3), reverse rich cream. Shown by Messrs. H. Shoesmith Ltd.

Chrysanthemum 'Pink Pride' A.M. September 7, 1954 as a variety for show purposes. Section XXI, Reflexed, large flowered, pink. Flowers 6½ inches diameter; florets long, broad, flat to slightly quilled, outer florets Fuchsine Pink (H.C.C. 627/3), inner florets Fuchsine Pink (H.C.C. 627/3) flushed with salmon pink, reverse silvery pink. Shown by Messrs. H. Shoesmith Ltd.

Chrysanthemum 'Red Bill Riley' A.M. September 22, 1954 as a variety for show purposes. Section XXII, Incurving, large flowered, red. Flowers 7 inches diameter; florets long, broad, channelled, deep crimson, reverse buff yellow. Shown by Messrs. Riley.

Chrysanthemum 'Red John Cooper' A.M. September 22, 1954

as a variety for show purposes. Section XXI, Reflexed, large flowered, red. Flowers 6¾ inches diameter; florets long, broad, curled, crimson, reverse buff yellow. Shown by Mr. W. B. Jackson.

Chrysanthemum 'Yellow Triumph' F.C.C. September 19, 1954 as a variety for show purposes. Section XXI, Reflexed, large flowered, yellow. Described R.H.S. JOURNAL 78, p. 221 (**A.M.** 1952). Shown by Messrs. J. & T. Johnson.

Chrysanthemum 'Yellow Wings' A.M. September 14, 1954 as a variety for show purposes. Section XXI, Reflexed, large flowered, yellow. Flowers 6¼ inches diameter; florets long, medium width, quilled, a very clear shade of yellow near Canary Yellow (H.C.C. 2/1). Shown by Messrs. J. & T. Johnson.

LATE-FLOWERING CHRYSANTHEMUMS

Chrysanthemum 'Galaxy' A.M. November 30, 1954 as a spray variety for cutting for market. Section IX, Single, small flowered, bronze. Flowers 3¼ inches diameter; florets short, broad, flat, outer florets bright orange bronze flushed with crimson, inner florets greenish-yellow. Shown by Messrs. Colham Green Nurseries Ltd., Chapel Lane, Hillingdon, Middlesex.

Chrysanthemum 'Golden Balcombe Perfection' A.M. October 19, 1954 as a variety for show purposes. Section V, Reflexed Decorative, yellow. Flowers 7¼ inches diameter; florets long, broad, channelled, Canary Yellow (H.C.C. 2/1), reverse slightly paler yellow. Shown by Messrs. Colham Green Nurseries Ltd.

Chrysanthemum 'Golden Guinea' F.C.C. December 14, 1954 as a variety for show purposes and for cutting for market. Section V, Reflexed Decorative, yellow. Described R.H.S. JOURNAL 79, p. 280 (**A.M.** 1953). Shown by Messrs. H. Woolman Ltd.

Chrysanthemum 'Limelight' F.C.C. November 30, 1954 as a variety for show purposes. Section III, Large Exhibition Incurving, yellow. Described R.H.S. JOURNAL 79, p. 281 (**A.M.** 1953). Shown by Messrs. H. Woolman Ltd

Chrysanthemum 'Lodestone' A.M. November 5, 1954 as a variety for show purposes. Section V, Reflexed Decorative, bronze. Flowers 6½ inches diameter; florets long, broad, channelled, pale chestnut bronze, reverse buff yellow. Shown by Messrs. H. Shoesmith Ltd.

Chrysanthemum 'Madonna' A.M. November 16, 1954 as a variety for show purposes. Section I, Incurved, large flowered, white. Flowers 5 inches diameter; florets long, broad, channelled, white. Shown by Messrs. H. Shoesmith Ltd.

Chrysanthemum 'Marvellous' A.M. November 16, 1954 as a variety for show purposes. Section V, Reflexed Decorative, light bronze. Flowers 5½ inches diameter; florets medium length, very broad, flat, Indian Yellow (H.C.C. 6/1). Shown by Messrs. Greenyer Bros. Ltd., Broadwater Green Nurseries, Worthing, Sussex.

Chrysanthemum 'Mayford Intensity' A.M. November 30, 1954 as a variety for show purposes. Section V, Reflexed Decorative, red. Flowers 6¼ inches diameter; florets medium length, medium width, slightly quilled, very deep velvety crimson, reverse chocolate brown. Shown by Messrs. H. Shoesmith Ltd.

Chrysanthemum 'Mayford Perfection' A.M. November 16, 1954 as a variety for show purposes. Section VI, Incurving Decorative, salmon. Flowers 7¼ inches diameter; florets long, broad, flat to slight channelled, creamy buff yellow flushed Crimson (H.C.C. 22/3), reverse buff yellow. Shown by Messrs. H. Shoesmith Ltd.

Chrysanthemum 'My Lady' A.M. November 5, 1954 as a variety for show purposes. Section V, Reflexed Decorative, pink. Flowers 5¼ inches diameter; florets medium length, medium width, quilled, outer florets Roseine Purple (H.C.C. 629/3), inner florets Roseine Purple (H.C.C. 629/3) flushed rosy pink, reverse buff yellow. Shown by Messrs. H. Shoesmith Ltd.

Chrysanthemum 'Orange Stuart Ogg' A.M. October 5, 1954 as a variety for show purposes. Section XVI, October flowering, Reflexed, large flowered, light bronze. Flowers 6¼ inches diameter; florets long, medium width, flat to slightly quilled, medium orange-bronze, reverse golden yellow. Shown by N. E. Ingpen Esq., Beechwood Farm, Heathfield, Sussex.

Chrysanthemum 'Orpheus' A.M. November 5, 1954 as a variety for show purposes. Section II, Large Exhibition, pink. Flowers 8 inches diameter; florets long, broad, quilled, tips notched, outer florets Mallow Purple (H.C.C. 630/2), inner florets Mallow Purple (H.C.C. 630/1), reverse silvery white. Shown by Messrs. H. Shoesmith Ltd.

Chrysanthemum 'Paramount' F.C.C. November 30, 1954 as a spray variety for cutting for market. Section VIII, Pompon, large flowered, white. Described R.H.S. JOURNAL **79**, p. 281 (**A.M.** 1953). Shown by Messrs. Colham Green Nurseries Ltd.

Chrysanthemum 'Patsy Robinson' F.C.C. November 5, 1954 as a variety for show purposes. Section III, Large Exhibition Incurving, pale pink. Described R.H.S. JOURNAL **79**, p. 281 (**A.M.** 1953). Shown by Messrs. H. Woolman Ltd.

Chrysanthemum 'Ralph Paine' A.M. December 14, 1954 as a variety for cutting for market. Section V, Reflexed Decorative, pink. Flowers 5 inches diameter; florets medium length, medium width, flat to slightly channelled, tapering, near Rhodamine Pink (H.C.C. 527/1). Shown by Messrs. Greenyer Bros. Ltd.

Chrysanthemum 'Red Star' A.M. November 5, 1954 as a variety for show purposes. Section V, Reflexed Decorative, red. Flowers 3½ inches diameter; florets medium length, medium width, quilled, deep reddish bronze, reverse pale yellow. Shown by Messrs. H. Shoesmith Ltd.

Chrysanthemum 'Ron Shoesmith' F.C.C. November 5, 1954 as a variety for show purposes. Section I, Exhibition Incurved, large

flowered, white. Described R.H.S. JOURNAL 79, p. 282 (**A.M.** 1953). Shown by Messrs. H. Shoesmith Ltd.

Chrysanthemum 'Rose Shoesmith' A.M. November 30, 1954 as a variety for show purposes. Section V, Reflexed Decorative, pink. Flowers 6 inches diameter; florets medium length, broad, slightly quilled, outer florets Tyrian Purple (H.C.C. 28/1), inner florets Magenta Rose (H.C.C. 027), reverse creamy yellow. Shown by G. Shepherd Esq., Holme Lane, Sheffield 6, Yorks.

Chrysanthemum 'Ruscombe Red' A.M. November 16, 1954 as a spray variety for cutting for market. Section V, Reflexed Decorative, spray, red. Flowers 4 inches diameter; florets medium length, medium width, flat to slightly quilled, crimson bronze. Shown by L. Mills Esq., Gipsy Road, Welling, Kent.

Chrysanthemum 'Shirley Superb' A.M. November 16, 1954 as a variety for show purposes. Section II, Large Exhibition, pink. Flowers 10 inches diameter; florets very long, broad, twisted and curled, Magnolia Purple (H.C.C. 030/2), reverse silvery white. Shown by Messrs. H. Woolman Ltd.

Chrysanthemum 'Snow Gleam' A.M. November 30, 1954 as a variety for show purposes. Section VI, Incurving Decorative, white. Flowers 5¾ inches diameter; florets medium length, broad, channelled, white. Shown by Messrs. H. Shoesmith, Ltd.

Chrysanthemum 'Symbol' A.M. November 5, 1954 as a variety for show purposes. Section V, Reflexed Decorative, light bronze. Flowers 6¼ inches diameter; florets long, medium width, quilled, a bright shade of light bronze near Yellow Ochre (H.C.C. 07). Shown by Messrs. H. Shoesmith, Ltd.

Chrysanthemum 'Tawny Queen' A.M. November 16, 1954 as a variety for show purposes. Section V, Reflexed Decorative, light bronze. Flowers 5¾ inches diameter; florets long, medium width, quilled, near Chrome Yellow (H.C.C. 605/1). Shown by Messrs. H. Shoesmith Ltd.

Chrysanthemum 'Teddy Doig' A.M. November 16, 1954 as a variety for show purposes. Section VI, Incurving Decorative, red. Flowers 7½ inches diameter; florets long, broad, channelled, deep rich velvety crimson, reverse light chestnut bronze. Shown by Messrs. H. Shoesmith Ltd.

Chrysanthemum 'William Mascall' F.C.C. November 5, 1954 as a variety for show purposes. Section III, Large Exhibition Incurving, other colour. Flowers 8¾ inches diameter; florets very long, broad, channelled, outer florets creamy buff yellow, inner florets Mimosa Yellow (H.C.C. 602/1). Shown by Messrs. K. Luxford Ltd., Sawbridgeworth, Herts.

Chrysanthemum 'Woking Perfection' A.M. November 5, 1954 as a variety for show purposes. Section VI, Incurving Decorative, red. Flowers 5¼ inches diameter; florets medium length, broad, channelled, deep mahogany red, reverse light chestnut bronze. Shown by Messrs. H. Shoesmith Ltd.

Chrysanthemum 'Worthing Yellow' A.M. November 16, 1954 as a variety for show purposes. Section V, Reflexed Decorative, yellow. Flowers 7¾ inches diameter; florets long, broad, flat to slightly quilled, Canary Yellow (H.C.C. 2/1). Shown by Messrs. Greenyer Bros. Ltd.

BOOK NOTES

"The Dahlia Growers Treasury." By A. T. Barnes. 160 pp. Illus. (Collingridge.) 15*s*.

This book should prove a great godsend to any keen amateur or professional Dahlia grower.

Mr. Barnes and his wife have been very keen growers and successful exhibitors of this flower for many years, which helps to make this book even more valuable to all concerned. Mr. Barnes has also been quite a successful raiser, which also helps to stimulate interest in any flower.

The articles which seem to be well and clearly written and easy reading for all to understand, are well backed up by some excellent illustrations.

The articles dealing with the cutting and packing of the blooms for a show will, I feel sure, prove of immense value to the up and coming exhibitor. So many flowers are ruined by bad packing, which I have noticed myself when judging at the various shows throughout the country.

STUART OGG

"Garden Paeonies." By James Kelway. 64 pp. Illus. (Eyre & Spottiswoode.) London. 1954. 10*s*. 6*d*.

This little book was written by the late James Kelway, of the well-known firm of nurserymen Kelway & Son, Ltd., whose enthusiasm for the paeony was such that he considered it to be " the best of all the hardy perennial non-shrubby plants for gardens in these islands". His eulogy of this group fills ten pages—much more space than is devoted to cultivation.

The remainder of the book is largely occupied by lists of species and cultivars with names of raisers and dates of raising, and descriptions varying in length from a single line to about fifteen lines. No variety in the list bears a date of raising more recent than 1933, and not one of the dozen or so which in the past twenty years have received the F.C.C. or A.M. of the R.H.S. is mentioned.

The fifteen small and dull coloured illustrations do not add appreciably to the value of the book.

N. K. GOULD

"Plants Indoors." By C. R. Boutard. 254 pp. Illus. (Putnam & Co., Ltd.) 18*s*.

As the vogue for indoor plants increases, so does the number of books on the subject, and this, definitely a plantsman's book, fills gaps, extends horizons and worthily provides the latest word and the most comprehensive advice.

Designed for the more serious enthusiast, this book goes into some detail about the growth and care of house plants. Although some instruction is elementary, it is understood that the reader has some slight horticultural background and is interested in the theoretical as well as the purely decorative and practical aspects of house plants. The author knows his subject and is not afraid to introduce into the home a truly catholic and in some cases unorthodox selection of plants. But here he is perfectly fair and the final section of the book, a tabulated guide, compresses all one need know for the successful propagation and cultivation of every plant mentioned.

Basically divided into three sections, the first deals with general principles, and advice is given on choosing plants, keeping them in the home with the minimum of disease and trouble, repotting and propagation. A chapter on arrangement is written from the practical rather than the æsthetic point of view. One criticism here: the suggestions given and the plates illustrating decorative schemes are generally of a more florid and overbearing nature than is generally accepted in this country and the author unhappily presupposes that central heating is generally enjoyed in our homes.

Individual plants are described and frequently illustrated in the second section. Careful study is here repaid by useful information, but the layout of some of these sections (*e.g.* pp. 90–91) is abominable.

VIOLET STEVENSON

"Growing Gladioli." By David Laidlaw. 151 pp. Illus. (Netherton & Worth, Ltd., Truro). 8*s.* 6*d.*

This is an extremely readable and interesting addition to the popular literature on the gladiolus. Mr. Laidlaw, who is a grower of wide experience, brings a freshness of observation to his subject which is very pleasing. There are twenty-five short chapters in the book devoted to such subjects as "Soil and site," "How a gladiolus grows," "Cutting flowers," "Harvesting and sorting corms," etc. Each one of these chapters is written from personal experience and there is no repetitive culling from previous works. I was particularly impressed by the chapter on "How a gladiolus grows," the description and the very clear line drawings giving a very satisfactory account of the growth and development of the plant. Mr. Laidlaw is also at his best when discussing the qualities of modern varieties of gladioli which he has grown. His account of modern raisers and of the history of modern varieties is also flavoured by his keen interest in the subject.

The book is not without faults. It is written in a racy style which some will find tiring; the author can be rather sweeping and dogmatic about some aspects of the culture of gladioli which require a more cautious treatment; particularly is this so in the account of the diseases of gladioli. There is also an ambiguous reference to the self-fertilization of gladioli; in fact many varieties are almost impossible to self. There are many aspects of the subject which might have been expanded to make a text-book of gladiolus growing. That was not the author's intention and his book is a very clear and straightforward account of gladiolus growing, laced with a great deal of personal comment on many of the modern varieties, which amateur and professional fellow-enthusiasts will greatly appreciate.

NOEL F. ROBERTSON

"The Alpine Garden." By C. F. Walker. 93 pp. Illus. (W. H. & L. Collingridge.) 15*s.*

A lot of the enjoyment of gardening lies in reading about it and Commander Walker's book will give much pleasure to alpine enthusiasts. He writes about alpine gardening in general and discusses from long experience all its aspects and problems.

I have to admit to having at first glance been startled by some shattering alliterative chapter headings, "Jesting with Gentians" and "Coping with Campanulas," and even more so, when I realized that they had originally been perpetrated by Farrer in his section on Gentians in "The English Rock Garden." A third, "Dabbling with Dianthus," I have not traced to Farrer, but in the matter of "alliteration's artful aid" the example of the Master is quite definitely not to be followed.

The title page and some of the chapter endings are embellished with some agreeable little steel engravings from various 19th century horticultural books. These are pleasant in themselves but the practice of inserting such must surely add to the cost, already high, of book production and thus to the price of individual books, and one wonders how worthwhile it is.

Some of the colour photographs illustrating the book, which is altogether pleasurable and interesting, are above the average.

MORTON

"Manures and Fertilisers." By A. M. Smith. (Nelson Books on Agriculture.) Crown 8vo. 275 pp. Illus. (Nelson.) 1952. 15*s.*

This book sets out to describe the various kinds of manures and fertilizer available to the grower, how they are made and how they are used. It is in fact written primarily for students, but the needs of the farmer in particular, and to a lesser extent the market gardener, have been kept in mind.

The book contains an accurate, clearly written and up-to-date account of the subject and covers farmyard manure, other bulky organic manures, liming materials, nitrogen, phosphate, potash and salt, the trace elements, the various methods of applying fertilizer to the crop, and the residual value of manures and fertilizers. The discussion of most of these topics is adequate, but if a criticism may be raised on a point of emphasis, the reviewer would have liked to see a fuller discussion of the effects of different methods of making farmyard manure and compost on its manurial value, for

this is a point of very great importance, particularly to market gardeners and small growers who keep a few animals on their holding.

The book also contains a number of illustrations, which are very well reproduced, though not all seem to be well chosen, for some hardly add to the interest of the book or understanding of the subject. But the book can be wholeheartedly recommended to persons interested in the subject, and since the book is well got up, the price is very reasonable.

E. W. RUSSELL

"The Cost of Growing Apples." By R. R. W. Folley. 41 pp. (Department of Agricultural Economics, Wye College, nr. Ashford, Kent.) 5s.

This Bulletin should be in the hands of every apple-grower interested in the cost of production.

The results should perhaps be accepted with some caution, owing to the small number of years under consideration. But the writer has gone to much trouble to marshal his facts and present them in a manner useful to the practical grower.

Although the farms differ materially in character and performance there are sufficient to enable a grower to compare costs and judge whether he himself may be unduly extravagant in any one respect.

The author points out, however, that low cost production may not be the most profitable and takes the correct view that no outlay should be spared if it will increase production or improve quality, i.e. increase net return sufficiently to cover adequately this cost.

He emphasizes the relationship of yield to cost per bushel, although it does not necessarily follow that the highest yield per acre gives the lowest cost per bushel.

An interesting point brought out is the relative cost of growing culinary and dessert apples. In view of the great difference in market value between the two, one is led to ask whether there is much future for the culinary apple. This is, however, so wrapped up with yield that a decision must await a further report, which growers will await with much interest.

Finally growers should welcome the comparative costs of grassed and cultivated orchards.

T. NEAME

"The World of the Honey Bee." By Colin G. Butler. New Naturalist Series. 8vo. 226 pp. Illus. (Collins.) 25s.

Seed-raisers and orchardists will find much of interest in this authoritative work by the Director of Bee Research at Rothamsted.

The pattern of pollination behaviour is clearly described with many original observations on recent research by foreign authorities, such as Von Frisch, whose dancing bees have excited the interest of layman and expert alike, or to give us fresh thoughts on the life-cycle of the young bee as laid down by Dr. Rösch. For the beemaster Dr. Butler's outstanding contribution is his discovery of "Queen substance" a waxy exudation covering the queen's body which carries an individual fragrance by which her attendants recognize and communicate her presence or, conversely, bemoan her absence if she is removed.

With due scientific caution (and undue modesty) he hesitates to claim that his theory of queen recognition has received absolute proof because ten thousand successful independent queen introductions have not yet been completed, but already the risks and uncertainties of this difficult routine operation are being swept aside. Mr. Butler also deals with other honey-gathering bees and with the antiquity of the species and many close-up bee portraits clarify the text—those from Mr. Abbott's film "Bee meets Bee," in the preparation of which Rothamsted collaborated, are particularly convincing. Rarely have we had a Bee book of such richness.

J. H. BRIER

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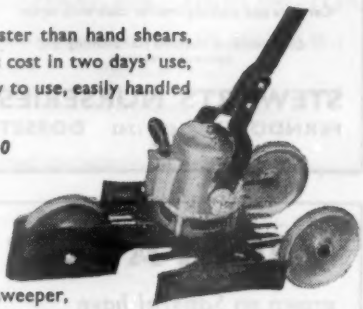

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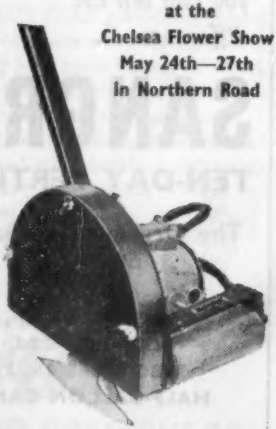

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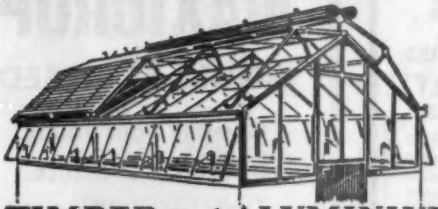

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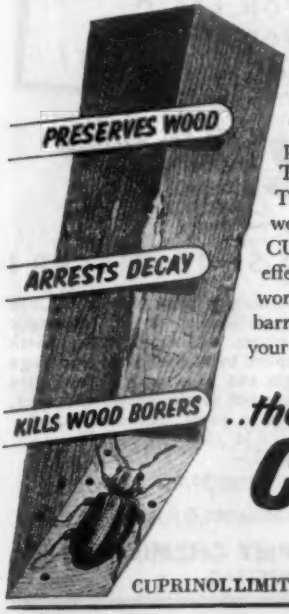

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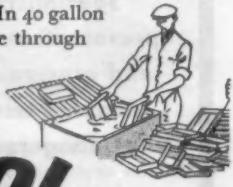

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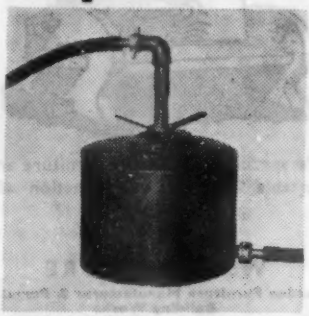

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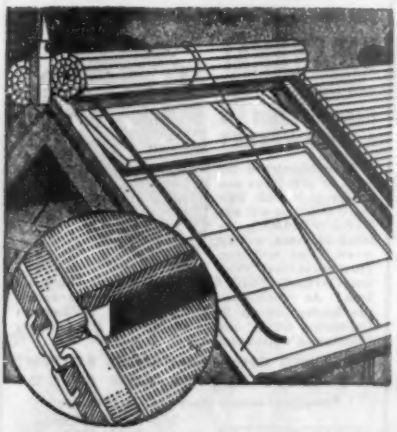

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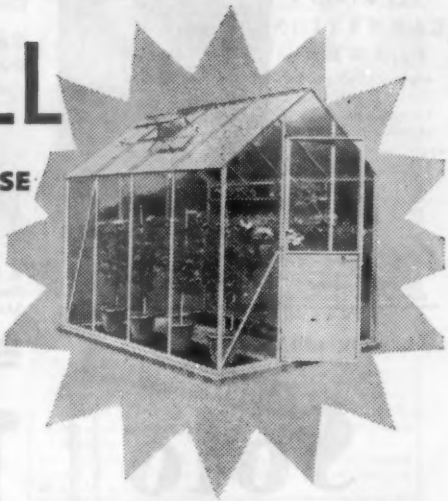

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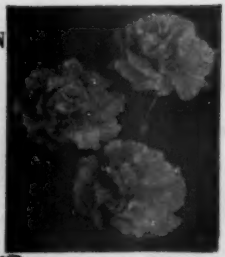

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5 ft.	25 0	30 0	35 0	40 0
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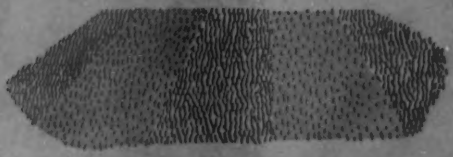

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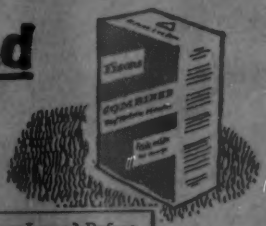

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